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Contents

PAGE

Cultures as Types? Some Elements of Classification Theory *by* F R HODSON . 1

Rescue Archaeology in Sussex, 1979 *by* PETER DREWETT (Ed), OWEN BEDWIN, DAVID FREKE, DAVID RUDLING *and* JAMES HADFIELD . 11

Chronological Table of Old Babylonian Seal Impressions *by* LAMIA AL-GAILANI WERR 33

Sherd Size in the Analysis of Occupation Debris *by* RICHARD BRADLEY *and* MICHAEL FULFORD 85

An Investigation of Sub-circular Cropmarks at Grey Goose Farm, Thurrock, Essex *by* H S TOLLER *and* T J WILKINSON 95

Periodisation in the Central European Bronze Age *by* VACLAV FURMÁNEK *translated by* ANTHONY F HARDING 117

Note: Chronological Systems in the European Bronze Age *by* ANTHONY F HARDING 125

Summaries of M.A. and M.Sc. Reports for 1978/79 129

Summaries of Undergraduate Reports for 1978/79 132

Book Reviews 141

The Contributors 207

Notes to Contributors 208

Cultures as Types? Some Elements of Classification Theory

by F. R. HODSON

Introduction: culture and confusion

The 'culture concept' has been under increasing attack from British archaeologists and to judge by some recent publications 'rejecting the culture model' represents a major archaeological endeavour. While it is undeniable that the term culture has been used carelessly by generations of archaeologists, it may seem prudent to attempt to distinguish between such abuse and any virtue that the concept may possess. That an essential function is indeed involved may be suspected from the frequent citation of cultures, whether consciously or not, even by the most ardent culture critics.

A few concrete examples, chosen from a very wide possible range, will set the stage. In the introduction to a recent, stimulating book Bradley criticises the Childean 'culture' suggesting that it is 'not a testable hypothesis' (1978: 2). But this is followed by references to the 'Larnian' and later to the 'Deverel Rimbury culture' and even to the 'Wessex Culture' (1978: 115). Thus at least one basic hypothesis about Childean culture, i.e. that it provides a useful classificatory device, is implicitly tested and validated. In similar vein, Champion suggests that 'it is time to seek alternatives to the culture model of prehistory', and yet, shortly afterwards, he interprets Britain at the start of the early Iron Age as 'a peripheral variant of Urnfield Europe . . . a contemporary variant, not a later derivation' (Champion, 1976: 138). The term Urnfield *Culture* may be avoided, but the concept clearly is not. A more conscious ambivalence has been expressed by Collis (1977) when he cautiously admits the culture concept for Neolithic and Early Bronze Age Europe, and even for some Iron Age manifestations on the continent at different hierarchical levels (Hallstatt, La Tène; Marnian, Hunsrück-Eifel), but is reluctant to follow this lead for Britain (e.g. Arras). His tentatively substituted terms, Early, Middle and Late, are perhaps a red herring, since they deal with chronology, not chorology, to use Childe's apt if hardly euphonious distinction.

These examples are taken from just a few of the more thoughtful recent statements on British archaeology but they do seem to reflect a rather general malaise. What is it that makes archaeological 'cultures' so irritating and yet apparently so inescapable?

As has been pointed out frequently before, the trouble must largely stem from the use of the one term, which already has a useful range of general meanings, for a number

of more or less technical anthropological and archaeological concepts. The basic confusion for archaeologists seems to arise from the conflict between any general sense that may be associated with the word culture, and the classificatory usage that simply recognises and answers an empirical need: to be able to refer collectively to material from more than a single archaeological site.

Even Childe, whose description of classification and interpretation for archaeologists is probably the most comprehensive and valuable ever attempted (1956), and who has provided the most generally accepted definition of an empirical culture ('a recurrent assemblage of types') – even Childe could not completely reconcile himself to the contrast between culture as generally understood and as he thus defined it. A culture might indeed be a 'recurrent assemblage of types' (Childe, 1956: 33, 112) but he hesitated to apply the concept without reserve: a recurrent assemblage of stone tool types 'should not be termed a culture but an industry' (Childe, 1956: 33). It is a pity that Childe did not once for all separate terminologically his empirical culture concept ('a culture in the archaeologists' partitive sense, the unit of chorological classification' (Childe, 1956: 112) from its interpretation into a 'society', and that he continued to use the one word in both senses. A stone industry must often in fact, *faute de mieux,* serve as the best available unit of chorological classification.

Accepting that there is an essential distinction between the archaeologists' 'partitive culture' and anything else, it may still be questioned whether the 'recurrent assemblage of types' definition is really suitable for it. Hodder and Orton (1976: 200) have highlighted the theoretically possible situation of slightly overlapping spatial distributions, where the overlap may be claimed to display 'recurrence' and yet to fall outside any intuitive appreciation of a valid empirical culture. In fact, Childe specifically envisaged and dealt with this situation (1956: 117) by introducing the term *concordant* (rather than recurrent) to describe equivalent spatial distributions and so to relate them to his culture concept. But even so, it may seem reasonable, in such an area of contention, to demand a definition that does not lay itself open to ambiguity.

The purpose of this paper is to search for such a definition but at the same time to put the concept itself in perspective, so that too much is not expected of it, nor too little. It must be stressed again that it is only the concept of culture 'in the archaeologists' partitive sense, the unit of chorological classification' that is at issue.

To anticipate, since the concept is basically a classificatory, heuristic device concerned with archaeological entities at a given empirical level (site assemblages) a start will be made from a concept that performs an equivalent service at a different level, where the entities are artifacts. This is, of course, the 'type' concept. An excuse for this approach would be that most archaeologists (even those unhappy with cultures) accept the usefulness of types, and that if a rather general method of classification is found useful in one context, the same principles and definitions may well prove useful in another. A close conceptual relationship between types and cultures has indeed often been claimed, perhaps in its most extreme form by Clarke (1968). However, even if this equivalence is accepted, the different definitions of type given by different archaeologists

are bound to imply different definitions and a different understanding of culture. Without a clear operational definition for type, the type approach to culture will not bear fruit and so a brief introductory statement on types is needed. This may be excused not only in this immediate context but on other grounds as well: archaeologists are increasingly attempting to record their data in a format suited to mechanical storage, retrieval and manipulation. The most obvious, economic and efficient way of so describing site-finds is to define and label a suitable range of types and then simply to associate with each excavation unit a count of those types present. This whole procedure obviously presupposes a clear understanding of the practical application of the type concept.

The type concept: types as item clusters

Unfortunately, although the type concept in one form or another is generally accepted by archaeologists, agreement on definitions has not yet been reached. Most archaeologists bypass the problem altogether by not in fact providing any operational definition of type at all. The main school of thought that has proposed a definition was initiated by Spaulding (1953; cf. 1977) and follows what has been called by a proponent the *attribute-clustering* approach (Cowgill, 1977: 127). This defines a type as, more or less, 'a non-random cluster of attributes'. As a basis for practical application, especially with quantified data, Doran and Hodson (1975) found this definition illusory since there were so many obvious empirical situations where it could not operate: for example, where just one attribute is concerned, or where the attributes are numeric rather than qualitative. This view is amplified in Hodson (1980) where a simple counter-example with two dichotomous attributes is introduced to demonstrate the failure of the approach for the two-attribute as well as the one-attribute case. (In brief, failure to discover men, women, boys and girls as 'types' from a population of individuals described by the two attributes sex (male/female) and age (juvenile/adult). Since the attributes are independent ('randomly associated') the existence of the four types could not be discovered by this procedure.)

In contrast, Doran and Hodson (1975) advocated what may be called an *item-clustering* approach (Cowgill 1977: 127). This defines a type as, more or less, 'a cluster of similar objects', a definition, it was claimed, that does lead to practical procedures for both the mechanical and intuitive discovery of valid archaeological types.

This alternative definition begs some immediate questions:

1. How is similarity between objects to be determined?
2. What are clusters and how are they to be recognised?
3. Once recognised, how are clusters to be specified?
4. How do clusters constitute an overall classification?

Attempting to answer these questions introduces a number of further classificatory concepts that are relevant to the empirical definition of types and that may later help to resolve problems concerned with the definition or non-definition of cultures. These will

be stated briefly and informally since most of the rationale has been presented in more detail, with references, in Doran and Hodson (1975) and in Hodson (1980). In this description the terms *unit* and *cluster* will be used rather than *object* and *type* so that the concepts may be given generality.

1. A classification of units depends on assessing their similarity one to another. This similarity will be assessed via one or more variables chosen because they are presumed, or have been demonstrated to be relevant. *Constellation* has been used to describe such a set of variables. Weighting must also be assigned to variables and, if appropriate, to constellations. Often, although not necessarily, equal weighting is assigned. In this case similarity between units will depend on the combined contribution of all variables, not on the performance of any single variable. That is to say that *polythetic* similarity is involved.

2. A *cluster* may be stated informally to represent a number of units that, as a group, display internal cohesion and external isolation: they are relatively similar to other units in their cluster, dissimilar to units in other clusters. Not all collections of units may be expected to show such clustering: other structures may exist (such as a linear series), or none. In such cases, artificial dissection into groups cannot have the heuristic value that is generally expected of a classification.

3. Once recognised, a cluster may be

   (a) Described by average values and ranges of variation for the variables concerned.
   (b) Distinguished from other clusters by key variables which economically discriminate between them.

4. A classification of units may result naturally in

   (a) A single division into equivalent clusters.
   (b) A hierarchy of clusters at different levels of similarity, often conveniently represented as a tree diagram or 'dendrogram'. (It seems important not to confuse this kind of representation and the rationale behind it with the superficially similar 'cladogram' or family tree showing the genetic descent of taxonomically equivalent units. This distinction has been emphasised by Sokal and Sneath (1963: 27, 221) and Doran and Hodson (1975: 160) but is apparently not recognised Renfrew (1979: 14).) Such a hierarchy may be achieved with or without prior weighting of variables or constellations:

      1. With prior weighting, clusters are divided at a sequence of levels corresponding with the relative priorities originally assigned to variables.
      2. Without prior weighting, highly cohesive clusters are combined to form clusters of less closely related units.

   (c) Although it is convenient to embody as many relevant aspects of the units as possible in the one classification whether hierarchical or not, it may

happen that conflicting similarities and consequently conflicting clusters result from separate constellations of descriptors. Here, a different classification will be required for each constellation of variables defined. This consequence may be of considerable importance if a realistic attempt at the mechanical storage and retrieval of information is being made.

To give examples: a familiar instance of paragraph 4(b)1 is the classification of metalwork into a hierarchy where a first descriptive constellation, related to utilisation, defines such types as weapons, tools, jewellery, and so on each with further functional subgroups. A second series of constellations is then used to define stylistic shape variations within each functional branch (bracelets, or fibulae, or swords are divided into types with identical utility but with different features). This stage may be thought of as a paragraph 4(b)2 situation where a stylistic hierarchy results from recognising groups of highly similar objects that may themselves be grouped into less cohesive clusters, without any initial priority having been assigned to the features concerned. (A pictorial example of such a stylistic hierarchy for bracelets is given in Hodson (1977: Fig. 2). A mechanical analysis of data so classified is presented in Hodson (1978).)

A paragraph 4(c) classification in the same context would result if the objects were grouped according to a constellation of variables representing art styles. Here, bracelets, swords and metal vessels may all be taken together and redistributed into a contrasting series of clusters: objects, for example, decorated in Waldalgesheim style, with simple geometric motifs, etc. A still further cross-cutting classification would result from the metal content of the objects concerned, i.e. by 'typing' them according to material.

In another familiar context, the adequate recording of Palaeolithic flint assemblages usually requires more than one contrasting constellation of variables that cannot reasonably be ordered in priority. One constellation at least is needed to describe technological features of blank production and retouch, another to deal with overall shape and, increasingly, another to deal with edge-wear patterning. These constellations may lead to at least three cross-cutting sets of classes or types to which each relevant piece must be assigned. Each separate classification will be needed to answer different questions asked of the material.

With pottery too, it is often necessary, although not often conceded, to have several cross-cutting classifications into types, for instance, one dealing with functional shape, another with decoration, a third with fabric.

It is not clear whether all of the classes of object mentioned in these few examples would be universally accepted as 'types', but grounds for exclusion would have to be argued with care.

Another final aspect of types not so far mentioned is whether, with hierarchies as envisaged in paragraph 4(b)2, it is possible to define set levels that will have general validity and that consequently should have fixed labels (e.g. 'subtype', 'variety'). While it may be possible to label such hierarchies in any given context (cf. *species, family, class* for metalwork at Münsingen: Hodson, 1968: 14), it would seem counter to the generality

of the type concept to insist on any universal straitjacket of the kind proposed in 'Analytical Archaeology' by Clarke (1968).

Cultures as assemblage clusters

If the item-clustering theory sketched out above has a general validity in archaeology it should apply to items or units other than artifacts – notably to the classification of total site assemblages. It is possible to test out this proposition by substituting in the above sections (paragraphs 1–4) *site assemblage* for *unit* and *type* for *variable* (admitting as types, types of features (graves, buildings, etc.) as well as of objects). It may then be possible to ask whether a term is needed for clusters of assemblages equivalent to types for objects, and in fact whether *culture* in the empirical, partitive sense corresponds. In other words *culture* may provisionally be substituted for *cluster* in paragraphs 1–4 above and the result examined. Thus paragraph 2 would read 'A culture may be stated informally to represent a number of assemblages that, as a group, display internal cohesion and external isolation: they are relatively similar to other assemblages of their culture, dissimilar to assemblages of other cultures' and so on. Similarly for paragraphs 1, 3 and 4.

If these statements are tested against such familiar cultures as those mentioned above, for example Urnfield or La Tène, it appears that paragraphs 1–3 arouse no particular alarm and that the definition of an empirical culture as a 'cluster of similar site-assemblages' corresponds rather well with established practice. Paragraphs 4(a) and 4(b) also seem reasonable. For example, the early stage of the La Tène Culture may be considered as a hierarchy with one level represented by Marnian, Hunsrück-Eifel and so forth (Early Arras perhaps included). Each shows internal cohesion and isolation as regards the others and yet all are sufficiently similar to be collected together at another hierarchical level as members of the La Tène Culture. I would regard the disputed Woodbury Culture (Hodson, 1964) as representing the same taxonomic level as Hallstatt or La Tène.

But what about paragraph 4(c): the provision for cross-cutting sets of cultures that may need to be defined from the same assemblages by contrasting constellations of types? It is quite possible to envisage such contrasting clusters of assemblages, some defined by utilitarian types, others by stylistic, but the former would hardly conform to any intuitive 'culture' however partitive. For example, certain assemblages would be grouped together because they contained a similar range of utilitarian equipment (a scrap-metal hoard cluster, for instance), but such a 'cluster of similar assemblages' would be alien to any intuitive notion of the culture concept as hitherto found empirically useful. Indeed, one obvious value of this traditional concept is that it allows quite different functional sites – cemeteries, settlements, hoards, to be related together. It would seem, then, that an essential element of the culture concept is an implicit emphasis on stylistic variables and types. This rather bald statement clearly masks fundamental problems and difficulties since such weighting presupposes an understanding of the nature and context of the available stylistic evidence, which may itself be highly diverse, complex and possibly conflicting.

In spite of these problems, it may seem reasonable to conclude that the archaeological culture conforms to the general rules for classification enumerated above (a culture is a cluster of similar assemblages), but that it represents a special case with restrictions placed on criteria of similarity. In this view, and with as little jargon as possible, a culture would be defined as 'a group of stylistically related assemblages'.

How does this definition of an empirical culture relate to the Childean 'recurrent assemblage of types' formula? May this latter be retained in a modified form, and if so, is there an attribute-based rather than an item-based definition for types more satisfactory than the 'non-random cluster of attributes'? It was suggested above in paragraph 3 that, once recognised, a cluster could be described and distinguished by specified variables and values. At first sight the provision of such specifications may seem close to an operational definition for type or culture. Thus a type would be 'a recurrent (or rather a modal) assemblage of variable scores', a culture 'a modal assemblage of stylistic types'. But such definitions are not really concerned with the practical discovery of types: they do not describe *how* modality or a sufficient degree of recurrence may be established. In Childe's formulation it would seem that 'recurrent' is made to bear more of the intuitive notion of clustering than it effectively can.

Accepting, then, that it may prove useful to recognise by the term culture (or complex if only it could be substituted) a cluster of site assemblages related by a wide spectrum of stylistic traits, what about assemblage clusters recognised via a restricted stylistic range – just pottery, metalwork or stone tools, for example? In practice, archaeologists have coined terms for such instances. Childe's *industry* of stone tools has already been cited, and tradition has been used for bronze hoards (cf. the Wilburton tradition) but also complex (cf. the Carp's tongue sword complex), and for pottery Cunliffe (e.g. 1978) has used the term 'style-zones'. Such distinctions seem most useful, and may, if properly controlled provide one basis for the preliminary study and differential weighting of heterogeneous stylistic evidence that may be encountered.

Terminology for types and cultures is also sometimes regarded as a problem: should a culture be named after a region ('Marnian', 'Wessex') or a site ('La Tène'), a pseudo-site ('Woodbury'), a pair of sites ('Deverel–Rimbury'), a type ('Beaker') or what? How representative should a label be of the culture as a whole? As long as a chosen label is recognised for what it is, a label and nothing more, it may not seem worth quibbling about its form. What really matters is that the labelled entity itself is precisely defined. It may be worth adding that to hope for any all-embracing, truly representative type-site for a culture must be misguided if the culture is defined polythetically.

A rather different question, and one that cannot be investigated here in detail, is whether any recognised 'culture' in this sense will automatically imply a past social entity of a given sort, a 'culture' in the non-partitive archaeological sense. The answer must be 'no', for it would be unreasonable to expect such a general concept to lead to such a specific interpretation. Clearly the significance of any empirical culture will depend on the basis of its recognition: on the comprehensiveness of stylistic variables considered and on the quality of the culture as a cluster, i.e. by the degree of internal cohesion and

external isolation that it demonstrates. Should a culture appear comprehensive on both counts, some explanation is called for and it may be difficult to imagine that such a material configuration can fail to reflect some important human entity. Recent enterprising ethnographic work in Africa by Hodder (1977), although not carried out primarily to establish an equation between clusters of stylistic material and social units (there described as 'tribes') does in fact point to a substantial equivalence (cf. Clarke and Chapman, 1978: 407). Similar claims are made in an early historic New World context by Brain (1978). However, far more of this kind of research would be required before it would seem prudent to seek fixed rules for relating such material and social groupings.

Conclusions

This proposed definition of empirical cultures or complexes has not been worked out in detail and is put forward essentially as a working hypothesis. Whether accepted or not, this discussion may perhaps have clarified some aspects of the culture concept that, to judge by comments quoted in the introduction, have caused confusion. Essentially, the concept is intended to allow single site assemblages to be grouped together so that discussion and interpretation may rest on a comprehensive basis. It enables not only sites that are functionally similar to be so grouped but such diverse assemblages as those from small and large settlements, cemeteries, hoards and so on, so that a full range of human activities may be encompassed. It potentially allows different functional and seasonal activities to be associated by concentrating on stylistic aspects shared between them. Without this concept it is not at all obvious how varying seasonal and functional activities are to be recognised as different manifestations of the same prehistoric social group. The demonstration that nearby sites are approximately contemporary clearly cannot by itself establish such a relationship. Provided that the concept is not expected to perform more than this very useful kind of service, to provide a general framework within which detailed prehistoric activities may be studied, it is difficult to see why it should arouse such hostility. 'Rejecting the culture model' in this sense is simply rejecting a basis for discussing economic and social activities of prehistoric groups from evidence at more than one site.

This is not to deny that, as currently understood and applied, the culture concept must be considered rather crude and it may be worth repeating for cultures some of the strictures introduced in paragraph 2 above for types. Classificatory concepts in general are intended to help the archaeologist to recognise, describe and summarise regularities in the data and so to distinguish the significant from the haphazard. If regularities do not exist, an imposed classification into groups need not be taken seriously. But not many accepted types and cultures need to be considered in this light. To suggest, as some archaeologists have done, that typological and cultural classifications are arbitrarily imposed by the archaeologist, is equivalent to believing that the notions of 'dog' and 'cat' are artificially imposed by the zoologist. Again, although regularity may occur in archaeology as clustering (suggesting types, cultures, etc.), other structures too must be expected alone or, more generally, associated with clustering. The alternative structure most familiar to archaeolo-

gists is a sequence (for example a seriation), but it would be surprising if other important structures did not remain to be isolated. A classification of sites into cultures, as generally practised, can hardly be expected to cope satisfactorily with such complexity, but this in no way invalidates any partial 'truth' that such procedures may reveal. Rather than reject the culture concept out of hand, it would seem more constructive to refine it so that interpretation may rest on a sounder, not a weaker basis. One approach at improvement involves the mechanical specification of classificatory procedures so that they may be programmed for a computer and set to operate on suitably quantified data. This exacts precise definitions and exposes the strength or weakness of any claimed method. So far it is mainly palaeolithic site-assemblages that have been investigated in this way (see, for example, Hodson, 1969: Fig. 23). By these means it has already been possible to discern an ordering of sites within and between clusters that reflects a more credible underlying pattern than could be expressed by a rigid recourse to cultural classification alone, but clearly much further experimentation remains to be done.

Abstract

Archaeologists in Britain have increasingly questioned the value of the culture concept as promulgated, especially, by Gordon Childe. An attempt is made to show, by analogy with the type concept, that cultures still play an essential part in prehistoric research. After discussing some definitions of type, it is suggested that a culture 'in the archaeologists' partitive sense, the unit of chorological classification' (Childe's phrasing) may be conveniently defined as 'a group of stylistically related assemblages'.

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Rescue Archaeology in Sussex, 1979: A Sixth Progress Report on the Sussex Archaeological Field Unit

by

Peter Drewett (Ed.), Owen Bedwin, David Freke, David Rudling and James Hadfield

Introduction (Fig. 1)

During 1979 the Sussex Archaeological Field Unit continued its policy of rescue archaeology operating within four main research projects as outlined in the third progress report (Drewett, 1977b). The Neolithic and Bronze Age Settlement Project proceeded with an extensive programme of sampling of barrows, fields, enclosures and hut platforms at Black Patch. The excavation of the univallate enclosure at Bury Hill, intended as a major contribution to the Iron Age Project, proved it to be Early Neolithic and so provided a new element in our study of Neolithic Sussex. It did, however, deprive the Iron Age Project of any activity during 1979! Further area excavations were undertaken at the Romano-British and Medieval sites on Bullock Down, together with a sample excavation

Fig. 1 Projects undertaken by the Sussex Archaeological Field Unit during 1979: 1. Bury Hill; 2. Black Patch; 3. Belle Tout; 4. Bullock Down Romano-British farmsteads; 5. Bullock Down Medieval settlement; 6. East Dean Church; 7. Seaford; 8. Rye; 9. Lewes; 10. Ringmer pottery kiln.

at Belle Tout, as part of the Multiperiod Project. Small scale excavations were also undertaken at East Dean Church, the parish church of the Medieval farmstead excavated on Bullock Down. The Urban Project continued with small scale excavations in Seaford, Lewes and Rye. Following the successful dating of Hartfield pottery by the excavation of a kiln at Lower Parrock in 1977 (Freke, 1979) an attempt was made to date Ringmer pottery by the limited excavation of a kiln site.

The work was again carried out by the Unit's full-time field staff. David Rudling joined the Unit as an Assistant Field Officer in January. He became a Field Officer when David Freke left the Unit in September to become Director of the new Rescue Unit at Liverpool University. James Hadfield was then appointed as a temporary Assistant Field Officer while Owen Bedwin was promoted to the post of Deputy Director.

I. Excavations at Bury Hill, Houghton, W. Sussex

by O. R. BEDWIN

The 1 ha enclosure at Bury Hill can be seen from the air as a distinct soil mark, especially after ploughing. This soil mark indicates a banked and ditched enclosure, now completely levelled by ploughing. A single entrance can be seen to the north-west.

The site is situated just below the summit of Bury Hill, overlooking the Arun Valley, a position remarkably similar to that of the causewayed enclosure at Offham (Drewett, 1977a). There are cross dykes to the north and south of the site, and the causewayed enclosure at Barkhale is about 3 km to the west. The site is ploughed annually and was chosen for rescue excavation in September and October 1979.

The interior of the enclosure was sampled by two trial strips, 9 m wide, running across the enclosure at right angles to one another (Fig. 2). No features were found, except for post-holes belonging to a modern rectangular structure, perhaps a sheep-fold.

Attention was then turned to the enclosure ditch; both terminals were excavated and the remainder of the ditch sampled by 12 other sections at regular intervals. (Part of the ditch along the south side of the enclosure was inaccessible as it lay beneath the South Downs Way.)

Although continuous, the ditch had a distinctly 'beaded' appearance, with a corresponding variation in profile. Its maximum depth was 120 cm, but was usually considerably shallower, and is thus unlikely to have defensive significance. The silting of the ditch was, however, remarkably uniform in the sections excavated. This consisted of a rubbly, primary silt, often extensive in deeper stretches of the ditch, overlain by a fine, brown fill, characteristic of slow silting below Downland turf. From the primary silts of the ditch came early Neolithic pottery, flintwork (mainly waste flakes with few implements), and animal bone. The pottery was in large, unabraded sherds, found mainly on, or just above, the ditch floor. There was little charcoal or calcined flint, and little indication of human skeletal material among the bone. A small amount of later Neolithic pottery was found in the brown upper silts.

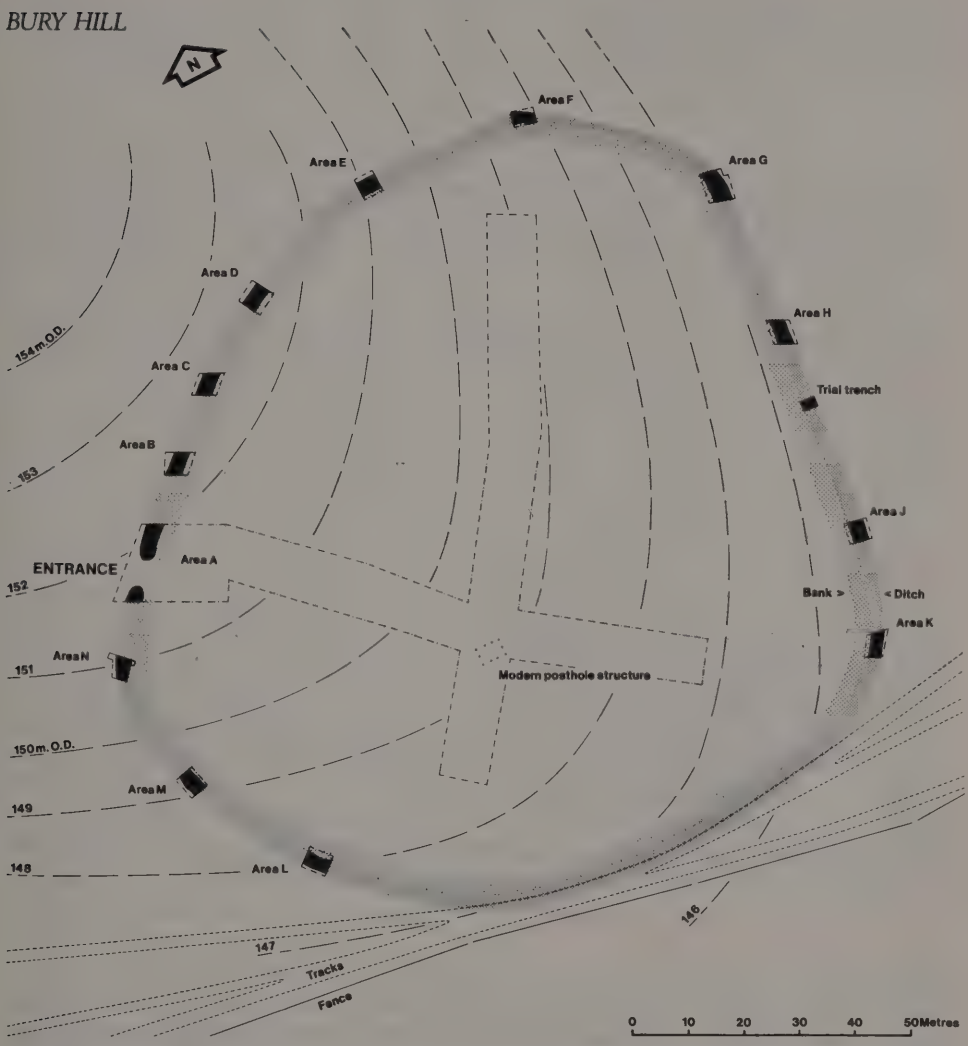

Fig. 2 Bury Hill, 1979. Plan of the Neolithic enclosure and areas excavated. Contours in metres. (Survey by F. G. Aldsworth)

The entrance was a simple break in the ditch and bank (Fig. 3). No post-holes were found to suggest either an entrance gateway or wooden revetting of the bank, which is therefore assumed to have been a simple chalk dump.

Although the date of the site is firmly established, its function is less clear, particularly in the absence of directly comparable Neolithic sites. As mentioned above, potsherds in the lower ditch silts were unabraded; the animal bone was also in large, well-preserved

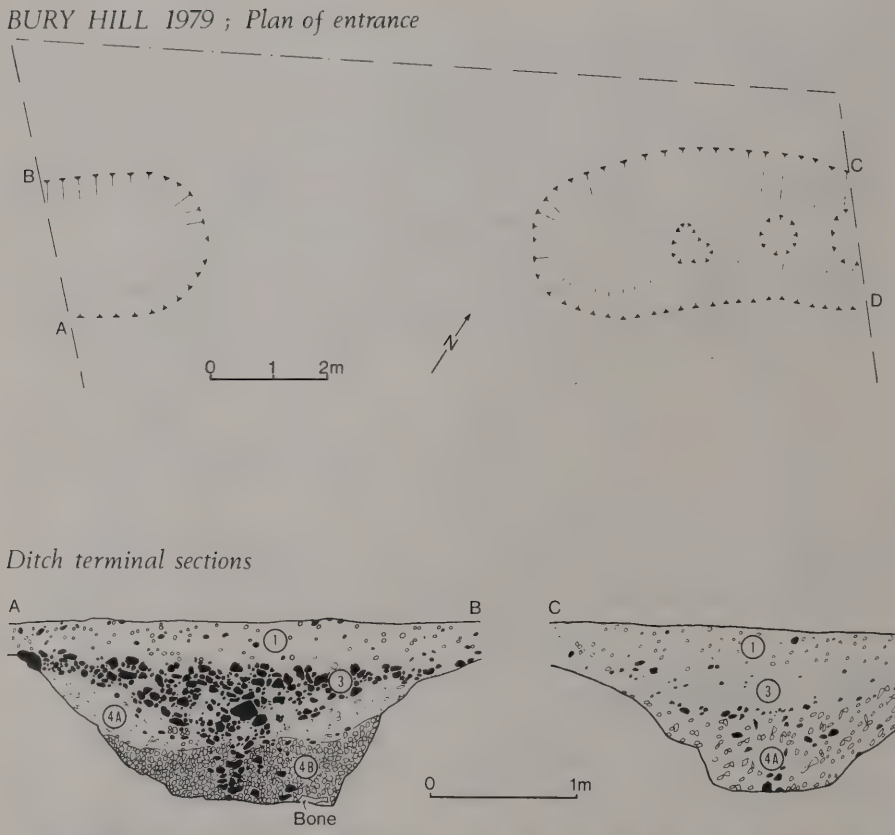

Fig. 3 Bury Hill, 1979. Plan of the enclosure entrance, and ditch terminal sections. Key to layers: 1. Modern ploughsoil; 3. Fine, soft, brown silt; 4a. Fine chalky fill; 4b. Coarse, rubbly chalky fill.

pieces. These observations suggest simple dumping of rubbish in the ditch. It seems unlikely, nevertheless, that the site was a settlement; two things conspicuous by their almost complete absence was calcined flint and charcoal. From the author's experience on Iron Age and Bronze Age settlements in Sussex, calcined flint in particular is found ubiquitously on such sites.

Equally, as there is little sign of human material among the bone recovered, it is unlikely that the site was associated with burial practices in the early Neolithic. Two further possibilities remain; the site may have been either a stock enclosure or a meeting place/ceremonial site. To distinguish between these alternatives would be difficult. For the moment, the importance of Bury Hill lies in its date; archaeologists can no longer assume that small, continuously ditched enclosures belong to the Iron Age or Roman periods, without proof by excavation.

II. The Excavation of a Later Bronze Age Settlement at Black Patch, Alciston, East Sussex

by P. L. DREWETT

The third season of excavation at Black Patch (Drewett, 1978, 1979) involved the total excavation of Hut Platform 1, sampling of Hut Platform 2 and Enclosures 1, 2 and 4, together with an attempt to date all the round barrows visible from the settlement site (Fig. 4).

Hut Platform 1 was selected for total excavation as it cuts across a pre-existing lynchet. This suggests that the huts excavated may be late in the sequence at Black Patch. The area excavated (Fig. 5) was unfortunately very badly disturbed in the last war. A substantial bomb hole and a network of slit trenches (not on plan) made interpretation of some areas of the site very difficult. The largest of the two huts excavated consisted of a circle of post-holes set on a shallow terrace (Plate I). A line of post-holes around the outer lip of the terrace suggests the roofing of the whole terrace. A grain storage pit, containing a dump of carbonised barley, was dug against the back wall of the hut. Although analysis of this grain is not complete, it is clear that it contains some beans as well as the usual range of weeds. Remarkably few artifacts were found on the hut floor. Only 13 potsherds were found, together with a scatter of flint flakes, seven cores and a few fire-cracked flints, foreign stones and fragments of burnt clay. The dating of this structure will, therefore, have to rely on C-14 dates from the grain dump. A date late in the Bronze Age is, however, tentatively suggested.

Hut 2, to the south of the main hut, is clearly a subsidiary hut comparable with Huts 2 and 5 excavated on Hut Platform 4 (Drewett, 1979). It consisted for a slight terrace cut into the chalk slope and contained a setting of five post-holes. Few artifacts were found on the hut terrace with the exception of a general scatter of waste flakes and a concentration of potsherds on the eastern edge of the terrace. To the south east of Hut 2 a shallow hollow may be the ploughed-out base of a pond of the type found on Hut Platform 4 (Drewett, 1979: Fig. 8).

Huts 1 and 2 did not appear to have been constructed in a fenced enclosure, although a curving fence line ran east from Hut 1. Some protection and shelter was no doubt afforded by the careful positioning of the hut in the south-east corner of a pre-existing field. Little survived of this field system except the compact, preserved rise in the chalk which was protected under lynchets surviving until the post-war ploughing of the site. To the south-west of the hut, a series of field marking-out ditches also survived. A shallow pit, dug against the south-eastern side of a section of field ditch contained a cremation in a Bucket Urn.

A single trench, excavated across Hut Platform 2, situated some 200 m south of Hut Platform 1, located a single small subsidiary hut of type 2 and 5 (Hut Platform 4) and type 2 (Hut Platform 1). Few artifacts were found, but enough to indicate that Hut Platform 2 is broadly contemporary with Hut Platform 4.

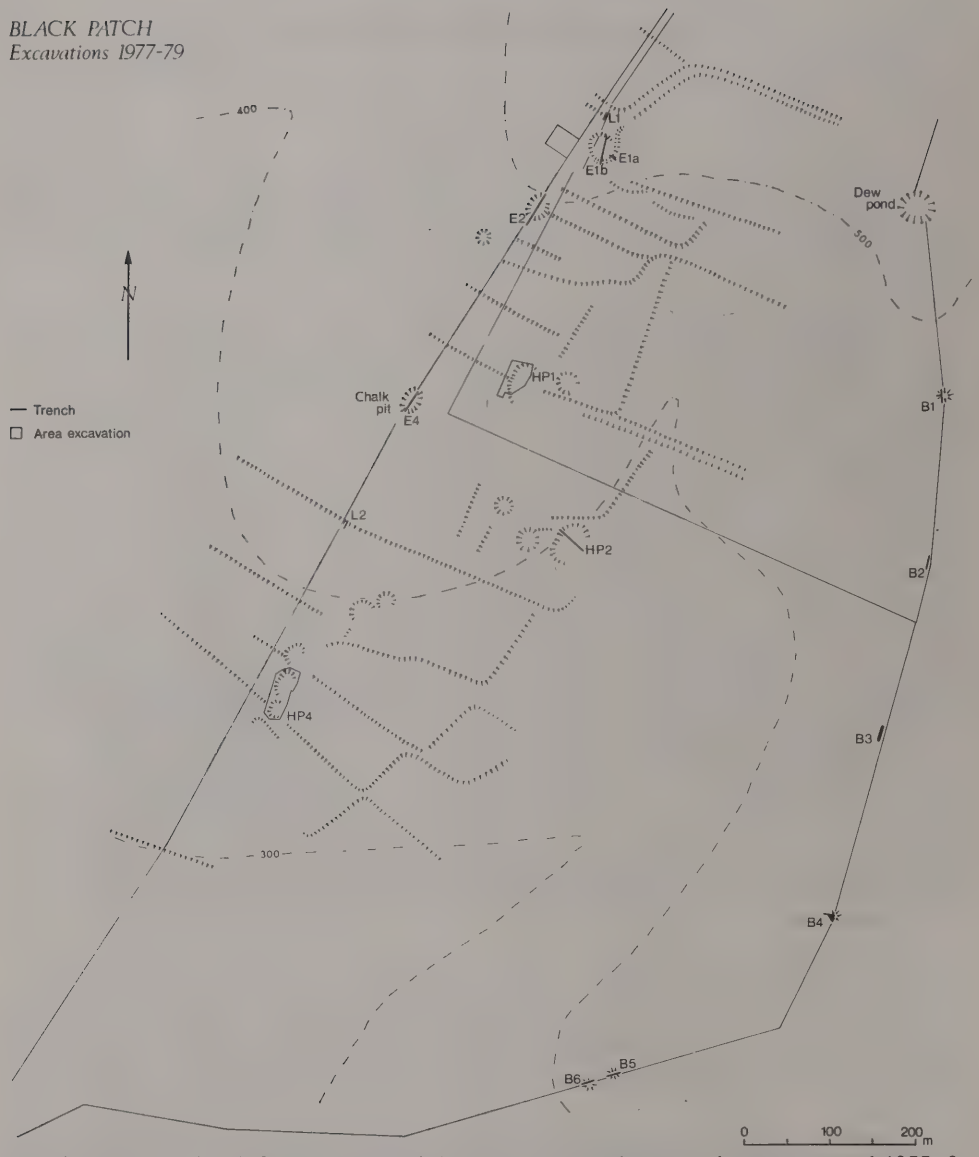

Fig. 4 Black Patch, 1979. New survey of the Bronze Age settlement and areas excavated 1977–9. Contours in feet.

Three enclosures were sampled with single trenches (Fig. 4). The purpose of these trenches was to establish whether these enclosures were simply stock enclosures or contained buildings. It was also hoped to date the enclosures. Enclosure 1, the most northerly enclosure, contained at least one circular hut and storage pit, together with

Plate I Black Patch, 1979. Hut Platform 1, Hut 1 from south. Scale 2 m.
(Photo: P. L. Drewett)

several isolated post-holes. Enclosure 2 also enclosed a single round hut, but a trench excavated across Enclosure 4 indicated that it was a back-filled post-Medieval chalk pit mistakenly interpreted as an enclosure on the 1950 survey (Curwen, 1954: 192).

The lynchet system, recorded on the 1950 survey, has now largely been removed by ploughing, but enough survived to enable a new survey to be made in 1979 (Fig. 4). This survey located two new lynchets. The excavation of Hut Platform 1 indicated that little was likely to survive of the lynchet except a slight preserved rise in the chalk. In an attempt to date the lynchets, therefore, two sections were excavated against modern field fences where some 40–50 cm of lynchet survived (Fig. 4). Two sherds of Later Bronze Age pottery, together with an absence of Iron Age and Romano-British pottery, confirm the probability that the field system is contemporary with the settlement. The

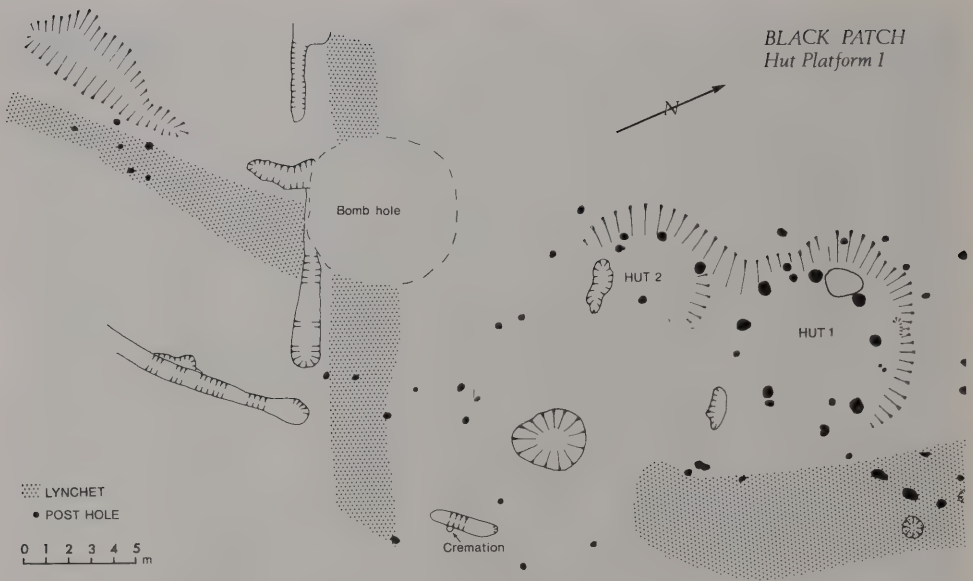

Fig. 5 Black Patch, 1979. The excavation of Hut Platform 1.

low density of Bronze Age pottery may be explained by either poor preservation or the absence of manuring in the Later Bronze Age.

The final aspect of the 1979 excavations at Black Patch was an attempt to locate the burial sites associated with the settlement. The Itford Hill barrow (Holden, 1972) underlined the probability that contemporary barrows may be intervisible with their settlement site. Eleven known barrows are visible from at least some of the settlement site. Eight of these barrows have been virtually removed by ploughing, while three survive under grass or scrub. All eight ploughed barrows were sampled during 1979. The sole purpose of these sample trenches was to obtain structural and artifactual evidence to aid dating. No attempt was made to excavate totally any of the barrows.

On purely structural grounds, only Barrows 4 and 8 are likely to have been constructed in the Later Bronze Age. One quadrant of Barrow 4 was excavated and showed it to consist of a low platform of large flint nodules. The platform was covered with many waste flakes and so was very similar to the Itford Hill barrow. Unfortunately, the area to the west of the barrow, the most likely area for burials, if the barrow is indeed like the Itford Hill barrow, had been totally destroyed by Second World War activity including a substantial latrine pit. Barrow 8, which consists of a flat topped mound some 12 m in diameter, is well preserved under grass and so was not sampled. On structural grounds, this is almost certain to be Later Bronze Age.

The remaining nine barrows all appear to be Early Bronze Age. Barrow 1 consisted of a low, much disturbed mound surrounded by a ditch 15 m in diameter. The mound

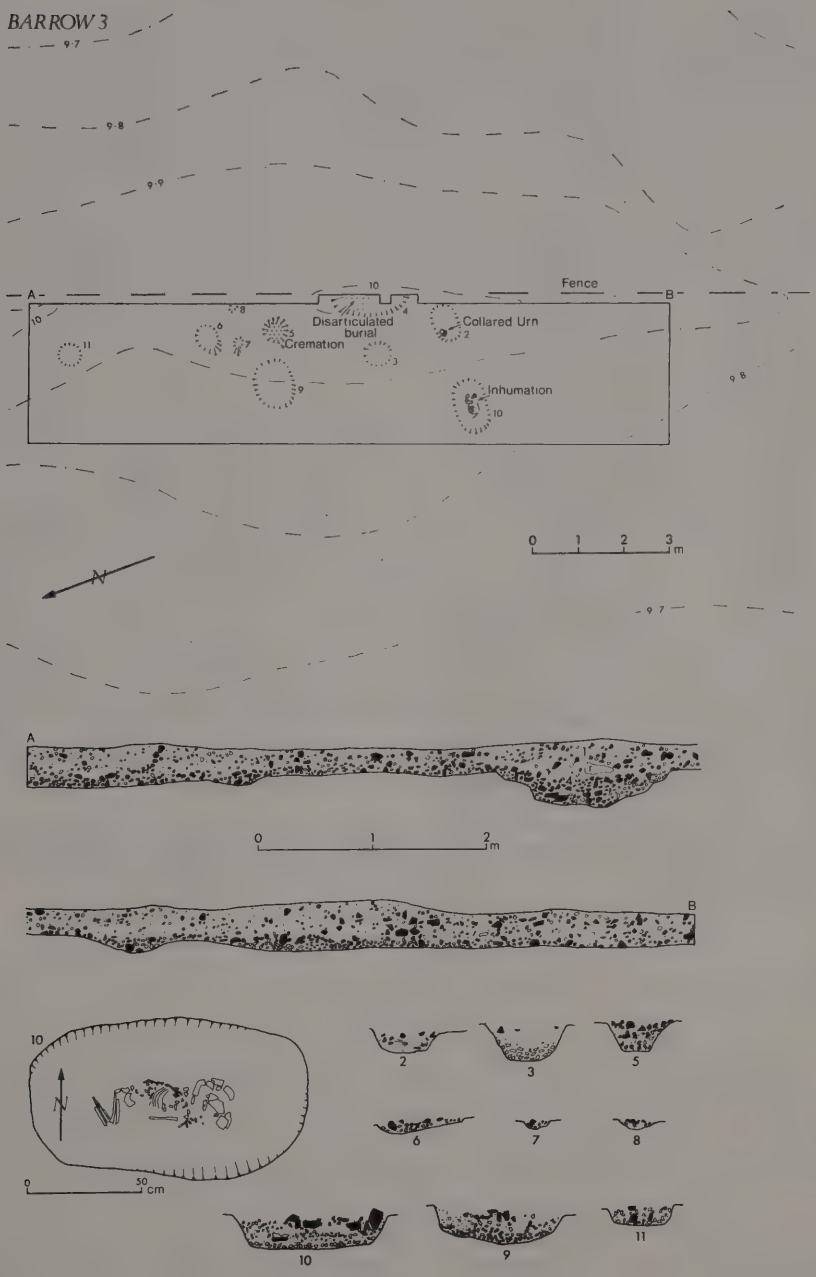

Fig. 6 Black Patch, 1979. A sample excavation of Barrow 3. Contours in metres.

itself appears to have been totally excavated at some earlier date. The size and shape of the mound and ditch, together with several Beaker sherds from the ditch fill, indicate a probable Early Bronze Age date for this barrow. Barrow 2 had been totally ploughed away. No ditch was located, but a few sherds of Beaker pottery from the plough soil may suggest an Early Bronze Age date. Barrow 3 survived only as a very slight rise visible along the fence line which crossed it. No ditch was located, but 10 shallow pits were found (Fig. 6). One contained a cremation, one a crouched inhumation, one a complete Collared Urn and one a scatter of disarticulated human bones. The remaining pits were empty.

Barrows 5 and 6 survived only as a slight rise in the fence line. Barrow 5 was encircled by a ditch 9 m in diameter and Barrow 6 by a ditch 10 m in diameter. No artifactual dating evidence was found in either barrow, although Barrow 5 produced a residual leaf-shaped arrowhead from the ditch. The structure of the barrows suggests an Early Bronze Age date. Barrows 7 and 9 both survive well under scrub. Their preservation probably results from the fact that they are both notable markers on the parish and estate boundaries. Both survive over a metre in height and appear to be Early Bronze Age bowl barrows.

Barrow 10 survived some 0.90 m high and Barrow 11 1.60 m high, although both are annually ploughed. Both are bowl barrows. Barrow 10 is encircled by a ditch 17 m in diameter and Barrow 11 by a ditch 18 m in diameter. On structural evidence both barrows are Early Bronze Age. This date was supported by the discovery of two pits under Barrow 11 each containing a complete Collared Urn.

The probability is that at least nine of the barrows visible from the settlement site predate the occupation of the site. Barrows 4 and 8 are the only two with structural elements consistent with known Later Bronze Age barrows in Sussex. The finding of a Bucket Urn containing a cremation apparently inserted in the edge of a field (see above) clearly confuses the neat burial arrangement suggested by the relationship of the Itford Hill barrow and settlement.

The Black Patch settlement clearly warrants many more years of excavation, but given available resources, 1979 was the last season for the foreseeable future.

III. Excavations at Belle Tout, Eastbourne, East Sussex

by O. R. BEDWIN

Although the large enclosure at Belle Tout (Fig. 7) has been sectioned at several places, no firm evidence dating the earthwork has yet been obtained. The clifftop location of the site means that it is subject to slow but steady coastal erosion; it was therefore decided to carry out a small excavation in an attempt to date the earthwork.

The area chosen was a short break in the earthwork; two sections were excavated through the bank and ditch, with a further three sections through the ditch only (Fig. 8). The irregular nature of the earthwork is clearly apparent; ditch profiles varied from 120 cm deep to only 5 cm. The bank, which consisted of a simple dump rampart, reflected this variability in the ditch. No post-holes indicative of wooden revetting at the front of

Fig. 7 Bullock Down, 1979. General survey of Bullock Down.

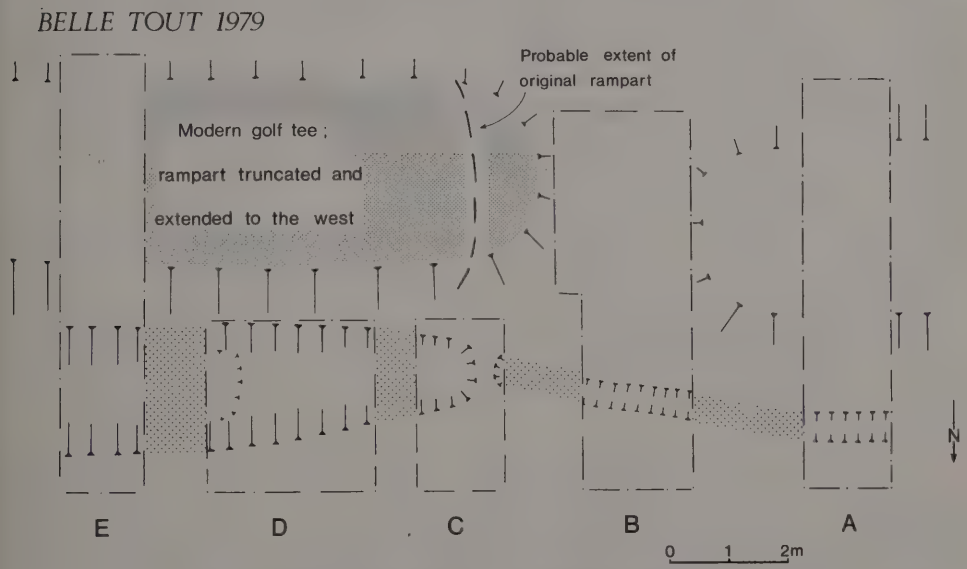

Fig. 8 Bullock Down, 1979. Excavations at Belle Tout.

the bank were found. No diagnostic artifacts were found in contexts which would date the enclosure; a few scraps of pottery, probably prehistoric, plus a round end scraper all came from the topsoil, and a few flint flakes came from the primary silts of the ditch.

In the area excavated, the earthwork had a distinctly 'unfinished' appearance. Its conventional interpretation as a stock enclosure (Bradley, 1971), should perhaps be reconsidered.

IV. Further Excavations at the Romano-British Settlement Sites on Beachy Head, East Sussex

by D. R. RUDLING

In order to follow up, and expand upon, the information derived from two previous years of excavations at the Romano-British settlement site (Fig. 7, No. 44) on Frost Hill (Rudling, 1978, 1979), Trench A of 1977 and 1978 was extended and two new trenches begun.

Trench A revealed a marking-out line (possibly for a field boundary); the remnants of an extremely ploughed-out ditch orientated approximately east–west; a fence line lying just to the north of the ditch and roughly following the same orientation; several isolated post-holes and small pits together with a much larger pit (1.4 m long by 1.2 m wide by 0.45 m deep) with vertical sides and a flat bottom. Very few finds were recovered from the features revealed in Trench A, but most contained some Romano-British pottery. The most common fabric was, as in previous years, East Sussex Ware.

Trench E (20 m by 16 m) was located immediately to the north of Trench C excavated in 1978 and was aimed at further investigating the marking-out line for a lynchet which was discovered in Trench C (Rudling, 1979), and to see whether there were any signs of there having been a well defined boundary on the northern side of the settlement. Very faint traces of the marking-out line for the north–south orientated lynchet were revealed, but there was no evidence for any east–west orientated northern boundary. Perhaps such a boundary marker, if it ever existed, may have been located to the north of the area investigated by Trench E. The only other features located in Trench E were a small, isolated pit, and a cross-shaped arrangement of shallow pits/beam slots together with a number of associated post-holes. One of the most plausible interpretations of this cross-shaped arrangement of features is that it may have been the base of a beacon.

The final trench, Trench F (Fig. 9), was an exploratory excavation to the west of the area investigated by Trenches A to E. The main features located were a ditch; two pits; several post-holes; and a modern 'Observation Post' dating to either the First or Second World War.

The stretch of ditch revealed by Trench F was not continuous, but was bridged by an area of undisturbed chalk which had probably been purposely left in order to create an entrance. The ditch showed signs of recutting and its main fill contained a small quantity of animal bones and Roman pottery. The purpose of this ditch is at present uncertain, but it is hoped that in the future it will be possible to trace it with the aid of

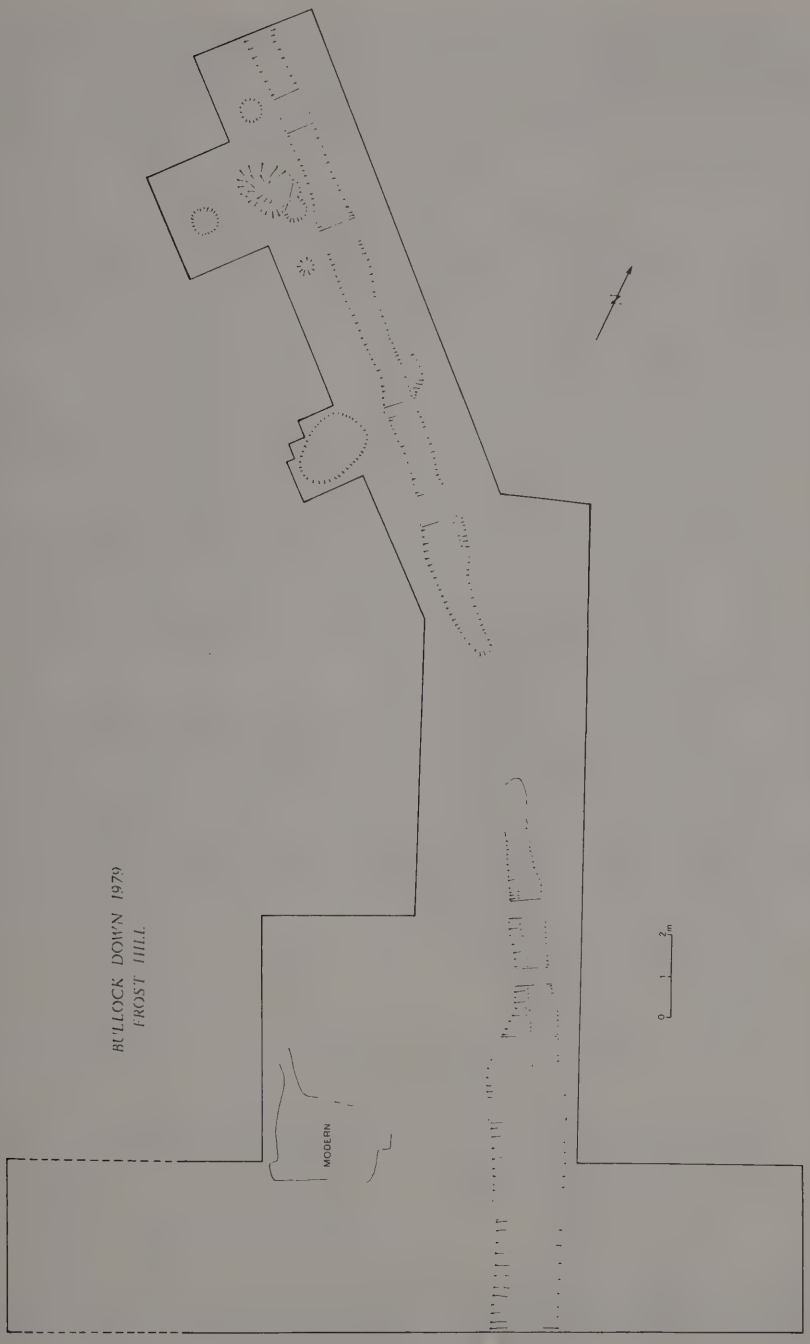

Fig. 9 Bullock Down, 1979. Frost Hill, Trench F, showing probable boundary ditch to Romano-British settlement.

geophysical techniques, thus enabling one to consider the excavated data alongside a more complete plan of the feature concerned. Possibly the ditch functioned as one of the boundaries of the settlement investigated by Trenches A to E, or perhaps it may have been a boundary between this settlement and another which may lie, as yet uninvestigated, further to the south-west.

One of the two pits discovered in Trench F was very similar to that found in Trench A, in that it was flat bottomed, vertical sided, and contained very few finds. With so few finds, the interpretation of these particular pits is difficult; one suggestion is that they may have been for grain storage, an idea, however, which does not gain any support from the results of the flotation of soil samples, since in both cases there was no carbonised grain present. Of the post-holes, three are very similar in size and shape and apparently belong to the same structure.

Exploratory excavations were made on the other main Romano-British settlement site known on Bullock Down from high densities of pottery and building material (Fig. 7, No. 16). This site has in the past yielded three coin hoards, many isolated coins, a variety of fibulae, finger rings, and various other metal objects, including a bronze lion's head terminal. The double lynchet trackway was sectioned and one of the marling pits to the east of the site was excavated in 1976 (Drewett, 1977b: 28–30). These excavations (Fig. 10, Trenches 1 and 2) demonstrated that the lynchets had developed during the pre-Roman Iron Age and the Romano-British periods, and that the marling pit was of mid Romano-British date (Drewett, 1977b: 17).

The aim of this year's excavations (Fig. 10, Trench 3) was to excavate totally one of the presumed house platforms which are located immediately to the north of the break in the double lynchet trackway. Unfortunately, although the platform yielded large quantities of potsherds, features were scarce, there being just a few small post-holes (some of which appear to form a fence line), two pits, and several small depressions. There is no real structural evidence for there having been a building on this particular terrace, but it is thus possible that if there had been a building (and the large quantities of domestic

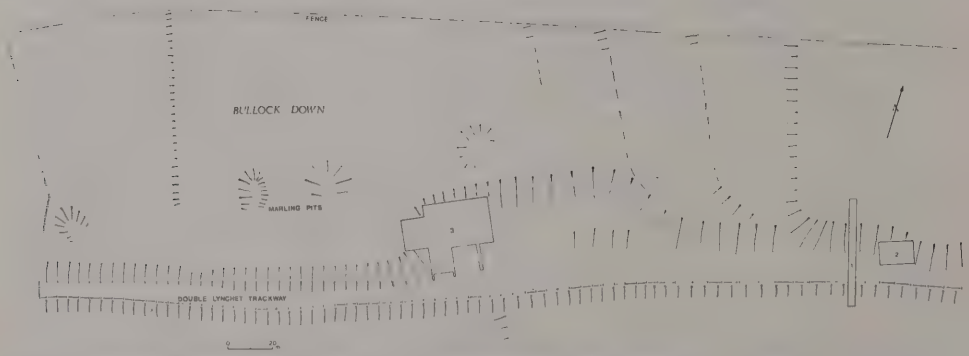

Fig. 10 Bullock Down, 1979. Location of 1979 excavation (3) in relation to 1976 excavations (1 and 2) and field system.

pottery suggest that this was probably the case) that it must have been of a type which does not leave any trace in the archaeological record. The majority of the pottery found on the terrace is of local, handmade, grog-tempered East Sussex Ware, and when taken as a whole, the pottery assemblage suggests that the site was occupied until about the mid 3rd century. Only two coins were found during the course of this year's excavations, which are in agreement with the pottery dating evidence, since they date to either the 1st or 2nd centuries.

An exploratory trench was used to investigate the area to the south-east of the main area of excavations. This revealed a small ditch running roughly east–west, containing in its fill several sherds of East Sussex Ware and a few animal bones. The ditch possibly represents the southern boundary of the settlement.

V. Further Excavations of a Medieval Farmstead at Kiln Combe, Bullock Down, East Sussex

by D. J. FREKE

An area of terracing below the site of the Medieval farm in Kiln Combe excavated in 1976–7 (Drewett, 1977b: 1978) was scheduled for ploughing in late 1979. The digging component of the Institute's field course was incorporated into the total excavation of an area 48 m by 36 m, which took place from March to May 1979.

A complex of buildings was revealed (Fig. 11). The main building was a dwelling which had been rebuilt at least three, and possibly four, times. This occupied the lowest terrace, which had been enlarged to accommodate the later phases of the building, whose axis seems to have changed at the same time. The earliest detectable structure was represented by two post-holes and two shallow trenches slightly skew to the later walls. This may therefore have been a timber building with timber or stone sills and corner earthfast posts, or the shallow trenches may have been drip gullies. The building occupying the enlarged terrace seems to have been a flint-walled structure. It was not possible to estimate the height of the flint walls from the quantity of rubble. Extensive robbing had removed all *in situ* flint from long stretches of the walls, leaving shallow robber trenches or possible drip gullies as the only evidence of walls. Several isolated chalk blocks making a right-angle on the north side of the structure suggest that the house was extended at some time to the west. The southern and eastern walls had also been rebuilt, using mortared flints. The south wall acted as a retaining wall for levelling up material inside the southern half of the house, the northern half being cut back into the slope. There was a doorway in the south-west corner, with a thick spread of rammed chalk inside and outside. A second doorway could be inferred from an interruption in the drip gully along the north wall. Any evidence of a possible opposing doorway was lost through robbing and erosion of the east half of the south wall. Eight interior post-holes together with a sandstone hearth suggest various successive internal divisions.

The latest arrangement seems to have been the classic Medieval hall with a central hearth, screens, passage and service rooms, but without a parlour. The door in the south-west corner was in use at this stage. The post-holes in the vicinity of the hearth suggest a

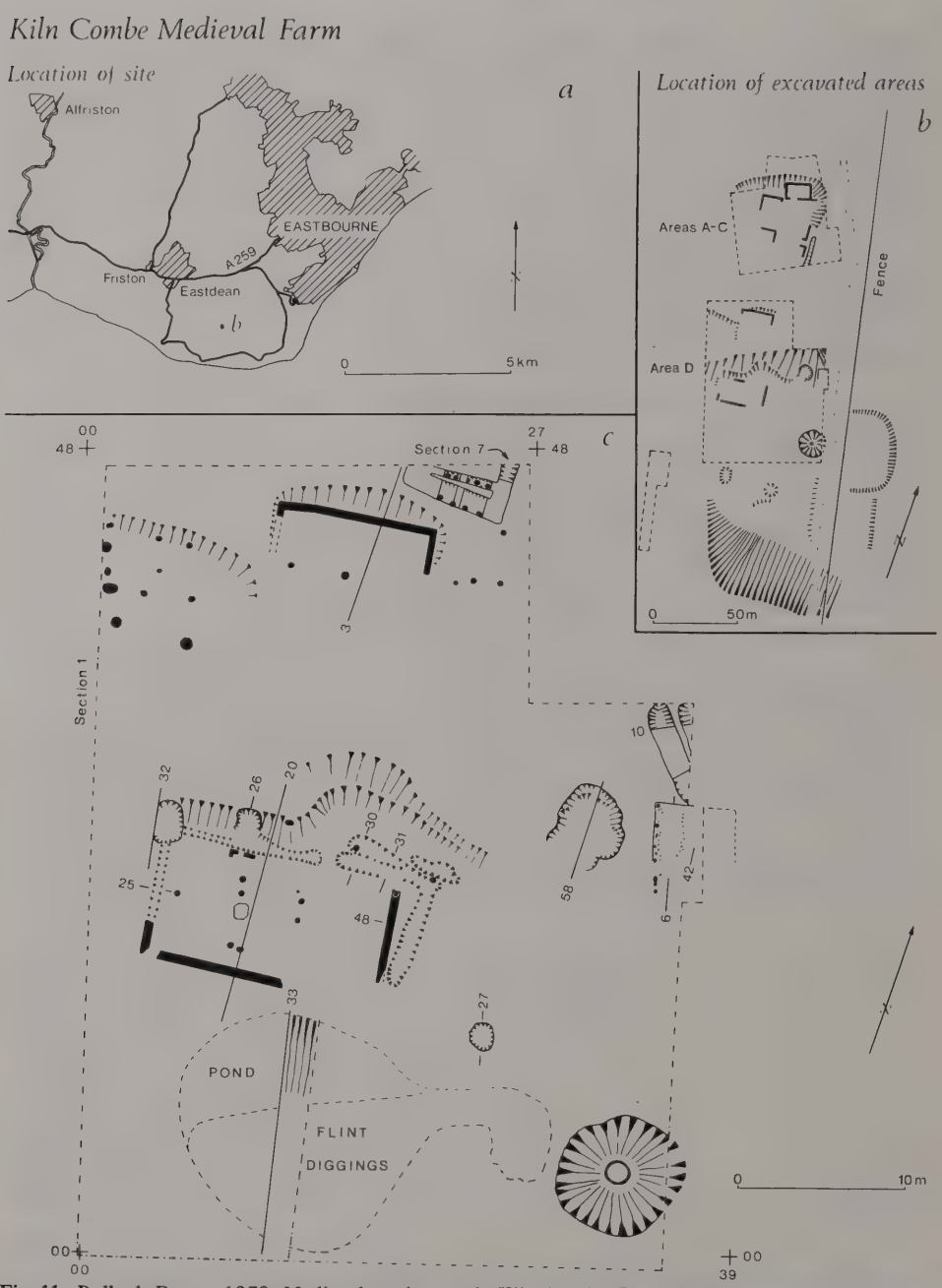

Fig. 11 Bullock Down, 1979. Medieval settlement in Kiln Combe. Plan of building on southern house terrace.

partition at the west end before the final arrangement, and there may have been a concurrent partition at the east end, making this earlier phase a three-bay long house. The right-angle of chalk blocks in the north side suggests an even earlier and smaller building, but there was no evidence of its internal divisions. The earliest structure only survived as shallow gullies at right-angles and two post-holes (see above).

There were two scoops cut into the chalk at the back of the terrace, one of which cut the north-west corner of the latest phase of building.

The only other flint walled building, to the north, also showed signs of rebuilding and enlarging, although only the northern half survived, protected by the ploughsoil and hillwash in the back of the terrace. The building was of drystone flint construction and had been extended by over 2 m to the west. To accommodate this, the terrace had been enlarged rather meanly, producing a kink in the north wall. Two post-holes parallel to the wall may indicate the mid-line of the building. The floor was slightly dished.

Slightly to the south-west and lower was a terrace with a complex of post-holes which could be resolved into three types:

(a) large irregular holes, one of which retained the post mould of a rectangular timber upright,

(b) smaller, round, deep holes at the back of the terrace,

(c) shallow irregular holes, in no obvious structural relationship to one another.

The terrace was not totally excavated, but it can be deduced that there were at least two phases of building, possibly two distinct buildings. The southern edge of this terrace had also been ploughed, so the existing southern post-hole may not be the limit of the structures.

There was another incompletely exposed set of structures at the north-east corner of the excavated area, again with at least two phases of building. Their chronological relationship could not be determined. They consisted of post-holes set within a trench, the southern trench being very shallow, possibly because of plough damage. The complete elucidation of these features awaits the excavation of the area immediately to the north.

On the eastern edge of the excavation was a kiln or oven, again of two phases. It was built in a shallow terrace, with the oven protected, on the west at least, by a fairly flimsy structure which may have been a windbreak or small roofed shed. The lack of uprights on the north and south may be evidence in favour of the former. There were two horse-shoe shaped ovens, the second of which cut through the west side of the first. A remanent magnetic reading was taken on the fired clay floor of the earlier oven. The second oven floor was made up of layers of fired clay fragments, burnt flints and considerable amounts of coarse, unglazed pottery. There were no wasters. It should be possible for the first time to date this common type of mid-Sussex coarseware.

A few metres to the west of the kilns was a chalk pit dug into the slope. In its backfill was a concentrated layer of mussel and limpet shells.

To the south of the dwelling was a shallow clay-lined pond. This was open when the house was demolished, and 19th and 20th century flint diggers had irregularly re-excavated it for the flint tumbled from the walls.

There was a well at the south-east corner of the site lined with mortared flints. It was not excavated below 3 m and no dating evidence was found in the packing behind the lining.

The finds from the site included some fine metalwork and exotic coins and jettons. The pottery from sealed contexts and from demolition levels was earlier in date than that from the farm building excavated in 1976–7. The building types also seem to be earlier, although very little is known about the evolution of Medieval farm buildings on the Sussex Downland. The date from the kiln, if it can be determined, will help to establish a chronology for this farm complex, and possibly others of its type elsewhere on the Downs.

VI. An Excavation in East Dean Church

by D. J. FREKE

The church of Saints Simon and Jude, East Dean, has four major periods of building: 11th century, late 12th century, 19th century and 1961. No church is mentioned in the Domesday survey of 1086. The earliest part of the present church is the three-stage tower which was a complete turriform church with an apse. The arch to the apse can be seen inside the tower, and there is also a blocked door in the south wall of the tower. The door in the west wall is modern.

The foundations of the apse had been exposed, probably in the late 19th century, and were reburied under layers of coke cinders from the early heating system. When this was replaced in the late 1940s by an oil-fired system, a concrete block was set over the apse to support the oil tank. Inside the apse was a thick layer of flints, which was continuous with the blocking of the apsidal arch. The apse foundations were built on a layer of chalk, mortar and gravel, above a dark brown loamy earth which contained fragments of human bone. This implies that the area was a cemetery before the tower and apse were built, which in turn implies that there was an earlier church. The apse foundations were built of crudely knapped flint nodules, with one Greensand block, perhaps representing a jamb or quoin of the arch. The mortar was hard, made of lime and fairly large (up to 10 mm), rounded flint gravel with some shell fragments, probably from the beach at nearby Birling Gap.

VII. Further Excavations in Seaford, East Sussex

by D. J. FREKE

Medieval Seaford grew up at the mouth of the Ouse, probably as an outport of Lewes. The quay is assumed to have been along the line of Steyne Road, although a small excavation in 1977 about 250 m to the west of the trenches reported here suggested that there Steyne Road may be a little north of the Medieval river bank. In view of this and the other evidence of the changing topography of Seaford, the opportunity was taken to check the supposed line of the Medieval river bank when the two sites to the south of

Steyne Road became the subject of planning applications. A J.C.B. was used to cut two narrow trenches. Both revealed thick layers of modern rubble under which were layers of silt and sand laid down in the Medieval period.

Trench 1 revealed a post-hole cut into the underlying sand. It was packed with chalk and clay and contained 13th–14th century pottery. It was sealed by a layer of gravel which was covered by grey silt up to 40 cm thick.

Trench 2 revealed a more complete series of stratified deposits. At the northern end, lying against clean sand under layers of silt, sand and gravel, were substantial fragments of a 13th–14th century cooking pot, together with other Medieval pottery fragments. At the southern end of the trench, terracing had cut through these deposits, but a disturbance in the clean underlying sand produced more fragments of Medieval pottery. The sharply increasing slope of the Medieval layers towards the north suggests that the trench was near the river bank.

The evidence of these two trenches suggests that this portion of Steyne Road is on or very near the Medieval river bank, but that this is not the site of the Medieval quay.

VIII. An Excavation at 1–3 Tower Street, Rye, East Sussex

by J. HADFIELD

Destruction of a Victorian building for the erection of a new building provided an opportunity to investigate the town ditch which is documented as having run around the northern part of the town (Dell, 1962). The murage grant for a stone wall was given in 1381 and by the mid-15th century, the northern part of the town was being developed by the townsmen, who were enjoying a rise of fortunes due to Winchelsea's decline as a seaport. In 1689 this area and the town ditch were still considered to be of defensive importance (Dell, 1962).

Excavation of this site calls into question the existence of a town ditch as any sort of 'formal' defence. Beneath the modern building disturbance and dumped materials (Fig. 12, 1–5, 7, 8 and 10) lay a thick deposit of beach gravel (Fig. 12, 6 and 13), which had been consolidated to produce a flat, durable surface. This gravel can be dated by a

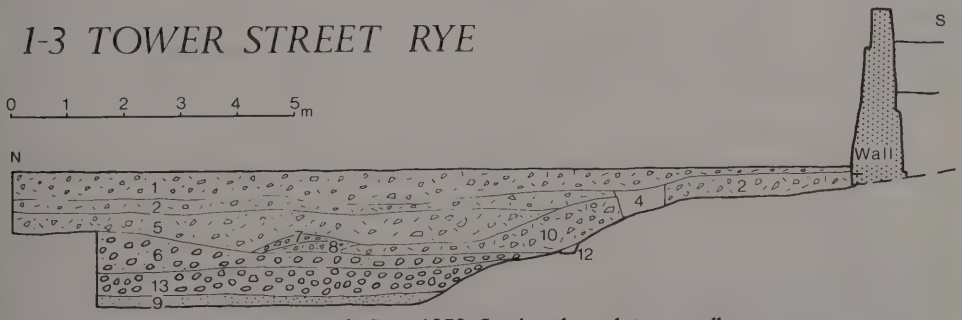

Fig. 12 Rye, 1979. Section through town wall.

coin of George II and pottery to the third quarter of the 18th century. A large quantity of shoes and other leather objects were also found.

Beneath the gravel lay a wet, silty layer (Fig. 12, 9) with few finds. This deposit may well be all that remains of the marsh that once extended around the northern part of the town. If so, then a combination of marsh and a cut-back bank would provide cheap and efficient defences.

IX. Excavations in Lewes, 1979

by D. R. RUDLING

During November, trial excavations took place on two sites threatened by development, both sites being located within the Medieval town boundaries.

Three small trenches were excavated on ground formally used as a garden in Broomans Lane. Problems of access to the site down the extremely narrow Broomans Lane meant that it was impossible to use machinery to strip a larger area.

The main objective of the excavation was to establish the existence of any Saxon occupation in the vicinity. Unfortunately, the earliest pottery found consisted of only a few sherds of Saxo-Norman type, the bulk of the Medieval pottery dating to the 12th and 13th centuries. Most of this Medieval pottery was found in pits cut into the natural in Trench II, although even in these features pottery was far from plentiful. The majority of the fairly small quantity of finds in each case was fish and animal bones and oyster shells. Trench II also contained a post-hole, and a rubbish pit dating to the early 17th century. It is interesting to note that Trench II lies approximately on the 100 ft boundary of the properties lining the southern side of the High Street. Trench I revealed a cess-pit containing material dating to the early 17th century, while Trench II exposed two pits, one modern, the other containing pottery of 15th or 16th century date.

During 1980 the Sussex Archaeological Society intend to enlarge their premises at Barbican House by building on the back yard, so a small trial excavation was undertaken to ascertain the extent of archaeological disturbance likely to result from the development.

The site is of interest since it is situated only a few metres to the south-east of Lewes Castle's fine Barbican or outer gatehouse, which was erected in the first half of the 14th century (Godfrey, undated). Barbican House itself is a 16th century timber-framed building which was enlarged and re-fronted in brick in the 18th century (Godfrey, 1977: 47).

In addition to exposing two relatively modern drains, the excavations revealed the foundations of a brick building, below which were the foundations of an unmortared wall, approximately 40–50 cm wide, orientated north–south, and composed largely of flints, with just a few pieces of chalk and two of sandstone. The date of these wall foundations is unknown and they were left intact since the proposed building work should not damage them. Finds from the trench included two early 17th century clay pipes, pottery of the 17th to 19th centuries, and just one sherd of Medieval pottery.

X. The Excavation of a Medieval Pottery Kiln at Barnett's Mead, Ringmer, East Sussex

by J. HADFIELD

Ringmer lies to the north-east of Lewes on the narrow strip of Gault Clay and this kiln was part of an important local pottery industry in the Medieval period, providing Lewes with much of its coarse wares. When this kiln was discovered as a result of ploughing bringing wasters and kiln material to the surface, the field was walked and the main waster heaps identified. The kiln was later identified with a magnetometer.

The kiln (Fig. 13) lay at the base of a shallow bank, orientated approximately north-east–south-west, that is into the prevailing wind. It was of the double opposed flue type, 2 m x 1 m, with a pair of chimney pots at each flue entrance, incorporated into the structure. The floor (Fig. 13, 59), of which little survived, may have been partly tiled.

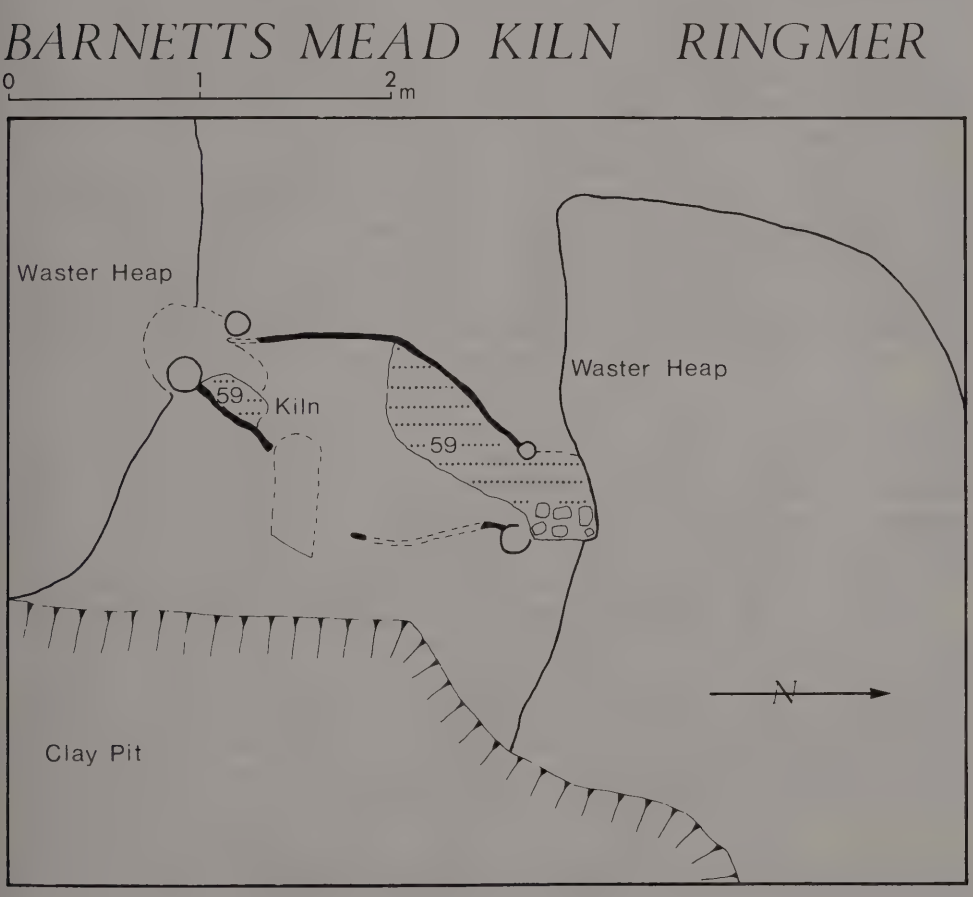

Fig. 13 Ringmer, 1979. Plan of Medieval pottery kiln in Barnett's Mead.

In the main trench (Fig. 13) to the east of the kiln and in three trial trenches further east, the natural clay was found to be substantially lower than expected as the area had been filled in, possibly in the 19th century. This area could be the clay pit, but may be associated with more modern tile manufacturing industries.

The fabric of the pottery is sandy with small flint incisions, and mainly oxidised. Decoration consists of grooved lines, thumb marks, thumbed strapping, pricking and a limited amount of glaze. The forms represented are largely bowls, storage vessels, cooking pots, pitchers or jugs and it seems that tiles and chimney pots were also being manufactured in the same area.

Acknowledgements

The Sussex Archaeological Field Unit would like to thank the numerous people who made this year's projects possible, particularly the owners and tenants of the sites for allowing us to work on their land, and all those who helped in any way. The names of the following must be mentioned at this stage, although detailed acknowledgement will be made in the final reports:

The Department of the Environment and particularly Dr C. Young and Mr S. Dunmore; the Firle Estate and particularly Viscount Gage, Mr P. Smith and Mr G. Vincent; Mr T. Malim, Mr R. Holgate, Mr P. Leach, Mr A. Sayers, Dr A. Ellison, Rev. R. Lewis, East Dean P.C.C., Mr F. E. Ford, Mr A. Barr-Hamilton, Mr G. R. H. Howard and Penarth Associates, Miss B. Todd, Miss S. Beardsworth, Mr M. Roberts, Mr M. Renkin, Mr E. Williams, Miss C. Stevens, Mrs P. Hinton, Dr K. Thomas, Mr T. P. O'Connor, Mr Rippon and the Sussex Housing Association for the Aged, the National Trust and Mr F. Aldsworth.

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Godfrey, W. M.	1977	*The Official Guide to Lewes.*
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Chronological Table of Old Babylonian Seal Impressions

by LAMIA AL-GAILANI WERR

While preparing my PhD dissertation I found it necessary to draw all the dated seals and impressions listed by Nagel in his articles in *Archiv für Orientforschung,* Vols 18 and 20. They formed an essential reference collection for comparison with my work on the chronology and regional styles of the Old Babylonian glyptic. Requests from a number of archaeologists for copies of my drawings as a useful catalogue covering the whole Old Babylonian period led to the suggestion that it should be published and made available to others who are dealing with the art of the period.

Most of the drawing I have done from photographs; exceptions are those from Louvre Cyl. ii and CT. 45 and 48, no. 39, which I drew from the original tablets while working on my dissertation. Those seals and impressions which were already drawn I have only copied. I have also added to the list more recently published dated seals and a few unpublished impressions from my dissertation which are relevant to the list. The height measurement is given wherever available. The seal inscriptions are only sketched in to complete the design and may not be entirely accurate.

Dated seal impressions have sporadically appeared in journals, excavation reports and other publications. Moortgat (1966) was the first to attempt a chronology of seal design from dated tablets of the Old Babylonian period (*c.* 2000–1600 BC). He based his conclusions on a Louvre collection (Delaporte, 1923), but as the greater part of these tablets came from the city of Sippar, they are not necessarily applicable outside this area. Nagel published a list of all the dated Old Babylonian seals that have already appeared in various books and journals (Nagel, 1957–8). He has greatly contributed to their classification, showing that, contrary to Frankfort (1939), many of the earlier seals are as fine in workmanship as those from the reign of Hammurabi. The best example of early glyptic is seal No. 6, showing possibly the god Nergal trampling on an enemy (Porada, 1951: 66–8). The seal is dated to King Abishare of Larsa and belongs to a seal cutter, so extra care must have gone into executing it. Nos 15 and 16 dated to the reign of Sin-iddinam of Larsa are other examples of the high standard of craftmanship in southern Babylonia during this early period.

Every single impression on the envelope of 14a, from the city of Sippar, bears witness to the superior manufacture of the original seals. This high quality of seal engraving

and the varied subjects depicted by the seal cutters at Sippar lasted throughout the reigns of Sinmubalit and Hammurabi, where I have been able to distinguish the products of two separate workshops (Gailani, 1977).

The method of indicating the beard by lines across the lower part of the face is peculiar to workshops operating during the reign of Shamshi-Adad (Nos 31, 32b, d and e). On the impressions from Sippar a characteristic of one workshop is the treatment of the flounced garments of the gods which are rendered with triple undulating lines.

By the end of the reign of Hammurabi and during that of his successor, Samsu-iluna, there is a noticeable change in the technique of cutting. An increase in the use of the drill is visible. At first, drill holes were left naked to emphasise such features as the fringed border of the worshipper's garment (No. 39, year 29). In fact, this technique marks the beginning of the gradual change in the glyptic during the post-Hammurabi era. Not only does the drill dominate the rendering of the subjects, but the seals become smaller in size particularly during the reigns of Ammiditana and Ammisaduqa; this is accompanied by a deterioration in execution and a restriction of the variety of the actual subjects, with the filling motifs nearly disappearing. There is also an increase in inscribed seals. The horned crown is replaced by a pointed cap surrounded by exposed drill holes resulting in the distortion of many figures (No. 50: Buchanan, 1970: No. 20). It is necessary to bear in mind that the present evidence from Babylonia is confined to impressions from the city of Sippar. The drill hole style also appeared in Syria at Alalakh Level VII during the reign of Niqmepuh (Collon, 1975).

Abbreviations

Amiet, Syria 37	Amiet, P.	1960	Notes sur le repertoir Iconographique de Mari a l'epoque du Palais. *Syria,* **37**: 215.
Balkan, TTKY VII	Balkan, K.	1955	Observations on the chronological problems of the Karum Kanis. *Turk Tarih Kurumu Yayinlarindan,* VII, Seri, No. 28. Ankara, Fifs. **7**: 22–3.
Bellerini, RSO 2	Bellerini, F.	1908	*Rivista delgi studi orientali,* **2**: 539, Pl. II, No. 4.
Belletin XIX/75	Özgüç, N.	1955	Türk Tarih Kurumu, *Belletin,* Fig. 32.
Boissier, RA 23	Boissier, A.	1962	*Revue d'assyriologie et d'archéologie orientale,* **23**: 18.
Buchanan, Iraq 33	Buchanan, B.	1971	A Snake Goddess and her companions. *Iraq,* **XXXIII**: 1–8.
Buchanan, Library Gazette	Buchanan, B.	1970	Cylinder seal impressions in the Yale Babylonian Collection illustrating a revolution in art *c.* 1700 BC. *Yale Library Gazette,* **45**: 53–65.
Buchanan, Ashmolean	Buchanan, B.	1966	*Catalogue of Ancient Near Eastern Seals in The Ashmolean Museum, I: Cylinder Seals.*
Buchanan, JCS 11	Buchanan, B.	1957	Further observation on the Syrian glyptic style. *J Cuneiform Studies,* **11**: 74.
Collon, 1975	Collon, D.	1975	The seal impressions from Tell Atchana/ Alalakah. *Alter Orient und Altes Testament,* **27**.

Collection de Clercq	de Clercq, L. and Menant, J.	1888	*Collection de Clercq – Catalogue methodique et raisonné – Antiquités assyriennes.* Vol. I. *Cylindres orientaux,* Paris.
Delaporte, Bibl. Nat.	Delaporte, L.	1910	*Catalogue des cylindres Orientaux et de cachets de la Bibliotheque Nationale,* Paris.
Delaporte, Louvre Cyl. II	Delaporte, L.	1923	*Catalogue des cylindres cachets et pierres gravées de style orientale (au Musée du Louvre).* Vol. II. *Acquisitions.* Paris.
Delaporte, RA 10	Delaporte, L.	1913	*Revue d'assyriologie et d'archeologie orientale,* p. 89.
Faust, YOS VIII	Faust, D. E.	1941	Yale Oriental Series, *Babylonian Texts.*
Figulla, VS XIII	Figulla, H. H.	1914	*Vorderasiatische Schriftdenkmaler,* tablets in the collections of the Staatliche Museen, Berlin.
Figulla, CT	Figulla, H. H.	1967	British Museum *Cuneiform Texts,* Vols. 45 and 47.
Frankfort, Cyl. Seals	Frankfort, H.	1939	*Cylinder Seals.* London.
Frankfort, OIP LXXII	Frankfort, H.	1955	Stratified cylinder seals from the Diyala Region, *Oriental Institute Publications,* Chicago.
Gordon, Iraq 6	Gordon, C.	1939	Western Asiatic seals in the Walters Art Gallery. *Iraq,* **VI** (26), 3–34.
Jitta, Cyl a la Haye	Jitta, A.	1952	*Catalogue sommaire des cylindres orientaux au Cabinet Royal des Medailles a la Haye.* The Hague.
Legrain, UE X	Legrain, L.	1951	*Seal Cylinders. Ur Excavations* **X,** Oxford.
Legrain, PBS XIV	Legrain, L.	1925	*The Culture of the Babylonians.* Publications of the Babylonian Section,/University Museum, University of Pennsylvania.
Lyon, JAOS 27	Lyon, D. G.	1906	*J AM Oriental Soc,* **27:** 135.
Moortgat, Rollsiegel	Moortgat, A.	1966	*Vorderasiatische Rollsiegel,* 2nd ed. Berlin.
Nagel, AFO 18 & 20	Nagel, W.	1957–8	Glyptische Probleme der Larsa-Zeit, *Archiv für Orientforschung,* **18:** 321–27.
		1963	*Datierte Glyptik aus Altvorderasien,* Vol. 20, pp. 125–7.
Parrot, Mari II	Parrot, A.	1959	*Mission archeologique de Mari, II: Le Palais.* Paris.
Porada, Sumer V	Porada, E.	1951	Nergal in the Old Babylonian period. *Sumer,* **5:** 66–8.
Porada, Impression on Cuneiform Tablet	Porada, E.	1976	Seal impression on the cuneiform tablet. In *Ancient Mesopotamian Art and Selected Texts* in the Pierpont Morgan Library, New York, pp. 35–42.
Porada, JCS 4	Porada, E.	1950	Review article of *Corpus, J Cuneiform Studies,* **IV:** 155–62.
Porada, JNES 16	Porada, E.	1957	Syrian seal impressions on tablets dated in the time of Hammurabi and Samsuiluna. *Near Eastern Studies,* **16:** 192–6.
Porada, Impressions from Sippar	Porada, E.	1962	The seal impression. In Mogens Weitemeyer, *Some Aspects of the Hiring of Workers in the Sippar Region at the Time of Hammurabi,* pp. 99–131. Copenhagen.
Ranke, BE VI, I	Ranke, H.	1906	Babylonian Expedition of the University of Pennsylvania, Series A: Cuneiform Texts.
Reade, Iraq 35	Reade, J.	1973	Tell Taya. *Iraq,* **XXXV.**
Scheil, RA 13	Scheil, V.	1916	*Revue d'assyriologie et d'archeologie Oriental,* **13.**

Tell al-Rimah	Dalley, S., Walker, C. and Hawkins, D.	1976	*The Old Babylonian Tablets from Tell al-Rimah,* London.
Unger	Unger, E.	1966	*Der Beginn Der Altemosopotamschen Sieglbidforschung,* P. XIII, Fig. 27. Vienna.
Von Der Osten, OIP XXVII	Von Der Osten, H.	1936	Ancient oriental seals in the collection of Edward T. Newell. *Oriental Institute Publications.* XXII. Chicago.
Von Der Osten OIP XXXVII	Von Der Osten, H.	1936	Ancient oriental seals in the collection of Mrs Agnes Baldwin Brett. *Oriental Institute Publications,* XXXVII. Chicago.
Waterman, AJSL 29	Waterman, L.	1913	Business documents of the Hammurabi Period. *Am J Semitic Languages,* **29:** 201–4.
Weidner, AFO 18	Weidner, E.	1957–8	Ein Siegelzylinder aus der Zeit des Jagitlim. *Archiv für Orientforschung,* **18:** 122.
Williams, AJSL 44	Williams, M. F.	1927	*Am J Semitic Languages,* **44,** No. (32), 243.
Woolley, Alalakah	Woolley, C. L.	1948	Excavations at Atchaa-Alalakh, 1939. *Antiq J,* **XXVIII:** Pl. LXIX, no. 75.
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	1951	Nergal in the Old Babylonian Period. *Sumer,* **VII:** 66–8.
	1962	*Some Aspects of the Hiring of Workers in the Sippar Region at the Time of Hammurabi,* by Mogens Weitemeyer. (chapter on the Seal Impressions). Copenhagen.

CHRONOLOGICAL TABLE OF OLD BABYLONIAN SEAL IMPRESSIONS

NO.1.
Kirikiri of Ahnunnah

Frankfort, O.I.P LXXII no. 709

28 mm.

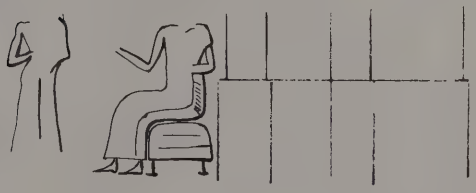
NO.2
UṢURWASSU of Ahnunnah.

Frankfort, O.I.P. LXXII, no.726

24 m.m.

NO.3
Lipit Ishtar of Isin

Legrain U E.X no. 440



NO 4

Erishum of Ashur

WVDOG 66, p. 10 abb. 1

Note: Measurements, where given, refer to height of design.

NO5
Urningizzida of Ashnunnah

Moortgat, Rollsiegel no. 254.

22mm

NO 6
Abisare of Larsa

Porada, Sumer V. 1951.

37mm

NO.7
Ibiqadad of Ashnunnah

Delaporte Bibl.Nat.
no.198

21mm

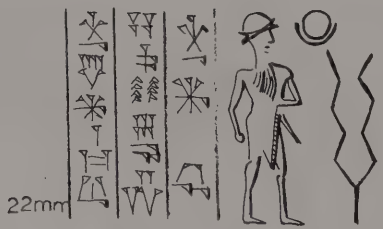
27mm

NO 8
Bursin of Isin
Moortgat, Rollsiegel
no. 255

NO.9.

Bursin of Isin

Legrain, UE. X, no. 540.



22mm

NO.10

19mm

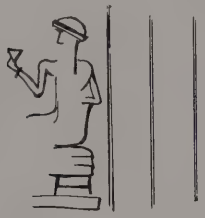
Bursin of Isin

Legrain UEX, no. 528

NO 11

Bursin of Isin

Legrain UE. X, no. 445



⊗

Bursin of Isin

Unger PI XIII, abb. 27

NO 12

Sumuabum of Babylon

Legrarain, PBS XIV

no. 326

⊗

22mm

Sin-abushu

ruler

Diyla Region

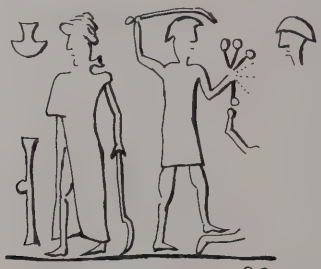
14mm

⊗

3b

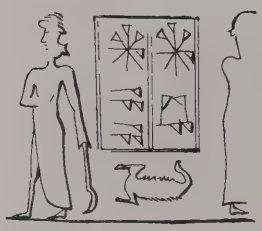
22 mm.

Sin-Abushu ruler Diyala region



4b

26 mm.



13.

22 mm.

21.a

16 mm

NO. 13
Sumulael of
Babylon

Delaporte, Bibl. Nat.
no. 138

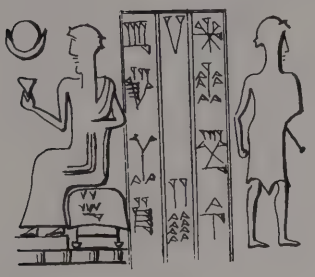
NO. 14

Sumulael of
Babylon

Delaporte, Louvre II
Pl 112. fig-9

20 mm.

NO. 14a Bunutahtunila of Sippar AJSL 29, p. 202, No. 2184A



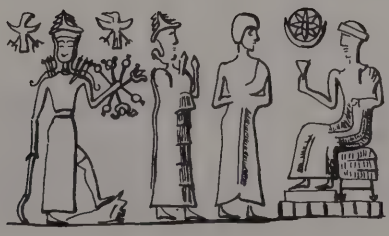
25mm

25mm

25mm

21mm

22mm



23mm

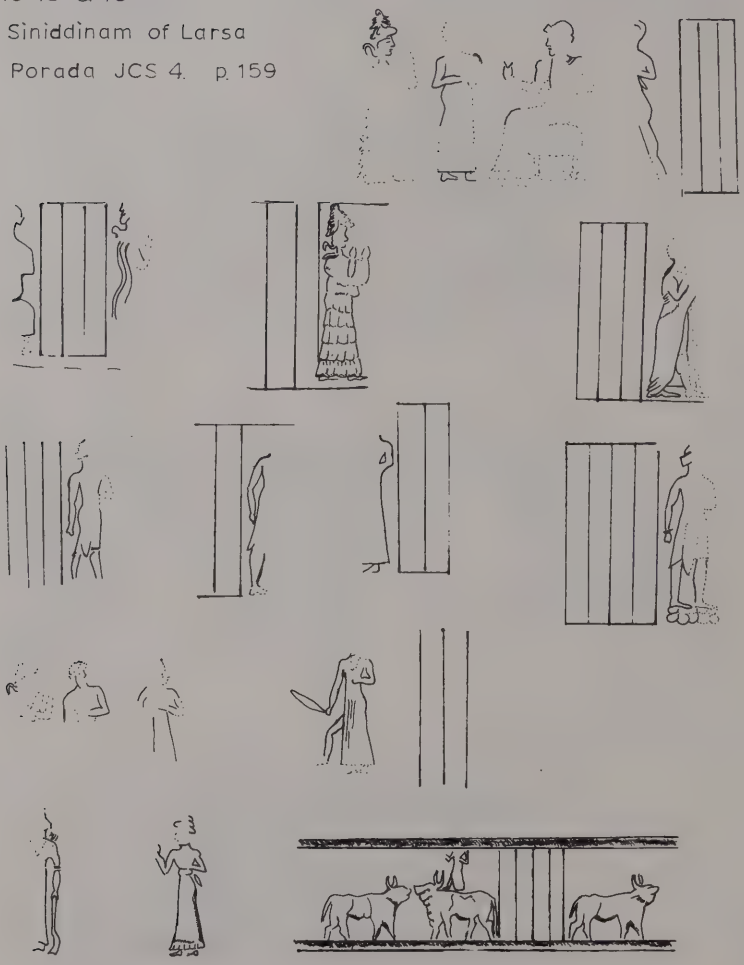
Hammidashur ruler Diyala region

22mm

NO 15 & 16

Siniddinam of Larsa

Porada JCS 4. p. 159



NO. 17
Siniddinam of Larsa
Legrain, U.E. X, no. 442

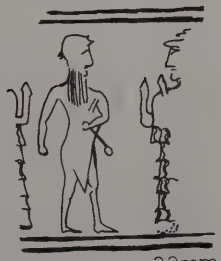
NO. 18

Sabium of Babylon
Legrain PBS XIV
no 327

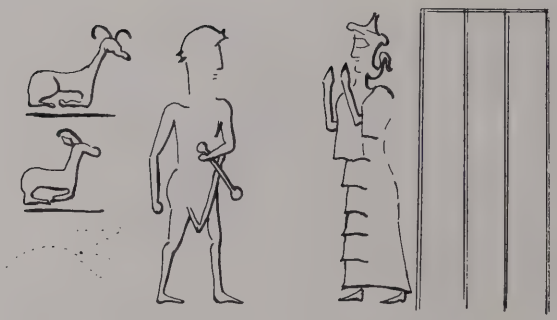
NO 18 a Sabium of Babylon
AJSL, 29, p. 202, no. 2189 A

⊠ Sabium of Babylon

16mm



22mm

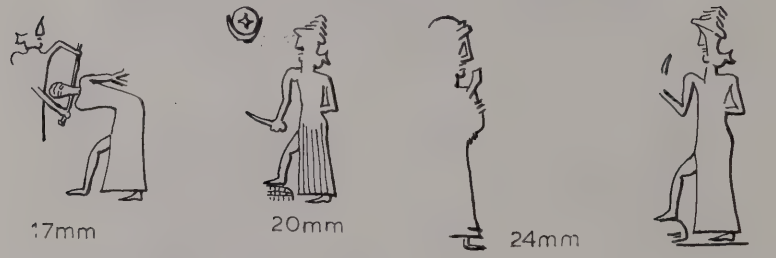


NO 19
Sineribam of Larsa

Williams, AJSL. 44, p. 243 no. 32

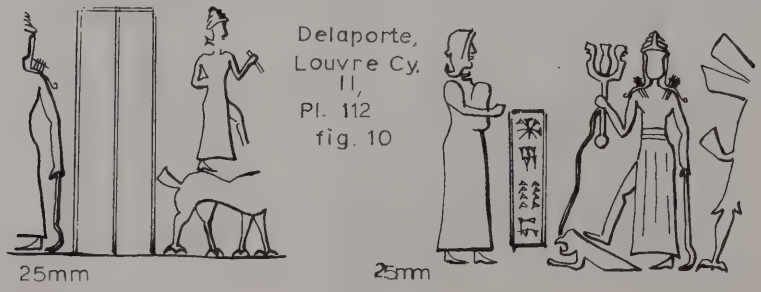
NO 20
Iššiʾakum Lugal (Ashur) Balkan TTKY. VII, fig. 1-5

Sin-Iqisham of Larsa



17mm 20mm 24mm 26mm

NO 21 Warad-sin of Larsa

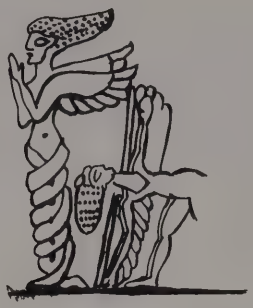


Delaporte, Louvre Cy. II, Pl. 112 fig. 10

25mm 25mm

Warad-sin

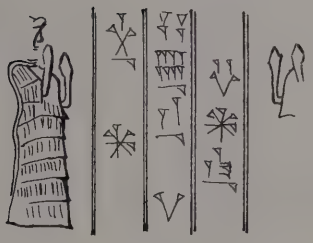
Buchahannan, IRAQ. 33.
fig. 1.



Warad-sin of Larsa

Figulla, XIII. Pl. III, no. 56-57

NO. 22
Ibalpiel of Ashnunnah
Weidner, AFO, 18.
p. 123, fig. 2



NO. 23
Warad sin. of Larsa
Legrain, UE. X.
no. 459

NO. 24
Apilsin of Babylon
Porada, JCS 4.
p. 159, fig. 1

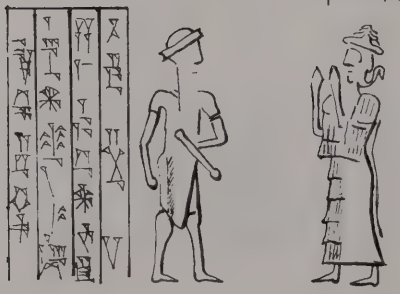
Apilsin 9th. yr. Figulla, VS. XIII, Pl. I, no.3.

18th. yr.

NO. 25. Sinmagir of Isin. Boissier, RA 23, p.18, no.7.

NO. 26.
Sinmagir of Isin
Delaporte,
Bibl. Nat.
no. 225

25mm



NO. 27.
Rim sin of Larsa
Moortgaat, Rollsiegel,
no. 322

27mm

NO. 28

Rim sin of Larsa

Collection de Clercq, I

no. 187

31mm

NO. 29.

Rim sin of Larsa

Von der Osten, O.I.P. XXXVII,

Brett, no. 78

NO. 29a.

Rim sin of Larsa

Von der Osten, O.I.P. XXII

Newell, no. 661

24mm

NO. 30. Rimsin of Larsa, 8th year

Delaporte,

Louvre, Cyl. II,

PL. 113, fig. 2

20mm

22mm

NO. 30 RIMSIN OF LARSA
Delaporte, Louvre .Cyl II

25th year
PL.113

22mm

20th year
PL.114, fig. 5,

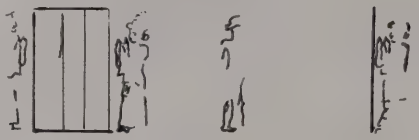
16mm

25 th, year

Legrain, PBS. XIV
fig. 324-5

Figulla VS XIII PL I"

no.65 30th year



no.66 31st year

no. 68, 31st. year

no. 72, 32nd. year

Faust, YOS: Babylonian Texts VIII,

PL. LI no.115
year 32.

Figulla, VS. XIII, PL. IV

35th year
no 73

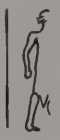
75 77

36th year

NO 30 Rimsin of Larsa

Figulla, VS. XIII, PL. IV

no. 78 year 37



79.

83. year 44

no 86 year 48

no 88

no 89

no 92
year 59

Rimsin of Larsa

year 59

NO. 30 a, Yaggid-lim of Mari, Weidner, AFO. 18, p.123, fig.1

NO. 30 b. Faust, YOS. Babylonian Texts, Vol. VIII.

PL.I
fig 2

fig.7

PL. IV

fig.8

PL.V, fig.9

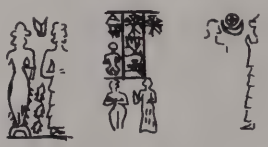
PL. VIII. no. 12

PL. XIII, no. 27

PL. XVII, no. 37.

PL. XVI, no. 35

PL. XXVII, 61.



PL. XXXVIII, no. 87.

PL. LXII, no. 139.

PL. LXV, no. 145.

PL. LXVI, 147.

NO. 31
Shamshiadad of Ashur
Delaporte, Cyl. II.
PL 80 fig. 7

24mm

NO. 32 a
Shamshiadad of Ashur
Delaporte, Louvre. Cyl. II,
PL. 78, fig. 12

24mm

NO. 32 b
Shamshiadad of Ashur
Delaporte, Louvre, Cyl. II
PL 80 fig 12

22mm

NO. 32 c
Shamshi adad of Ashur
Delaporte, Bibl. Nat.,
no. 216

26mm

NO. 32 d
Shamshi adad
Delaporte; RA. 10
p. 89

NO. 32 F, Shamshi adad, Frankforte; Cly. Seals, PL. XXVI, fig. k

27mm

Shamshi adad, Tell al Rimah, PL. 107, no. 3

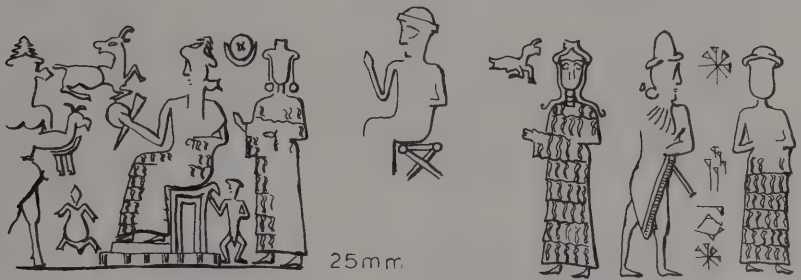
⊗ Shamshiadad of Ashur E Unger, PL XIII, fig. 27.

⊗ Shamshiadad of Ashur. J.Reade. IRAQ, 35, PL. LXXII, d.& e.

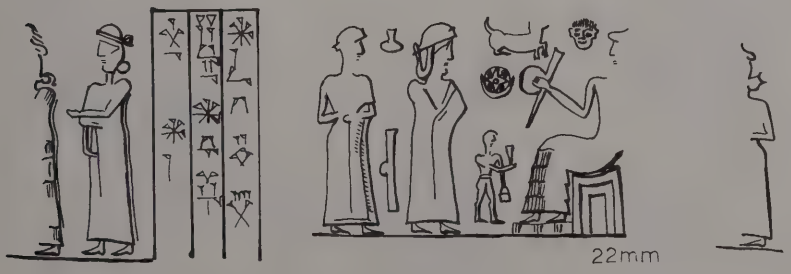
⊗ Shamshiadad of Ashur

26mm

NO. 33. Sin-muballit of Babylon



Figulla, CT. XLVII, PL.6, no.11a



Figulla, CT. XLVII, PL.8, no.12

NO. 33 Sinmuballit of Babylon Buchanan, JCS.11, p.45, PL.1

year 14. Delaporte, Louvre, Cyl. II, PL.114, fig.1

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NO 33 Sin-muballit of Babylon 14th year

Delaporte, Louvre Cyl. II, PL.114, fig. 5.

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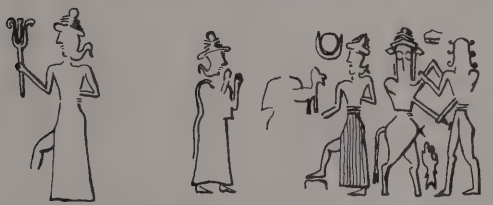

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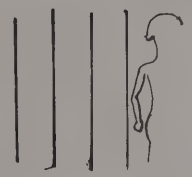

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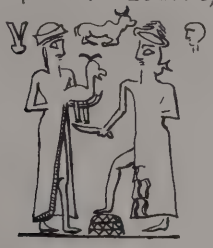
Delaporte. Louvre, Cyl. II, PL 114, fig. 2



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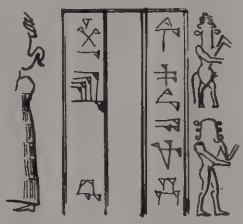

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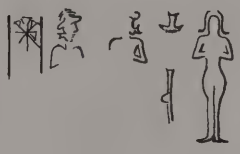

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NO. 33. Sin mubalit of Babylon. Delaporte, Louvre, Cyl. II.
PL. 113. fig. 4.

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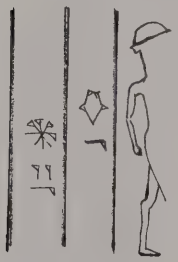
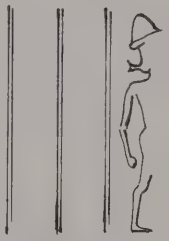
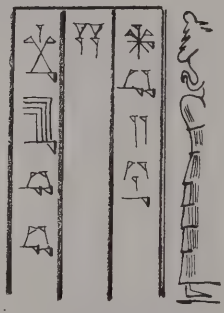
Ballerini, RSO. 2. p. 539 no. 4 & PL. II







Figulla, V S. XIII,
PL. 1, no. 10.

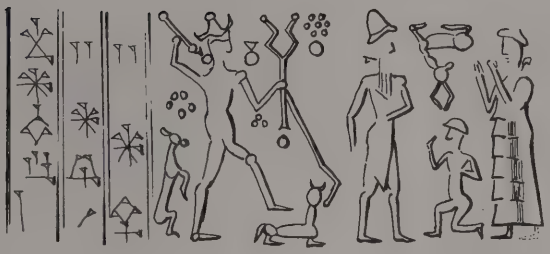
NO. 34

Naramsîn of Ashnunnah

Frankfort, Cyl. Seals

PL. XXVII, b

32mm

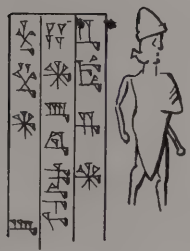


NO. 35

Nagel, A.F.O. 18.

p. 321, fig. 2

⊗



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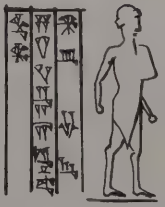
c. 22mm

d. 22mm



e. 26mm

f. 22mm

NO. 35 a

Yahdullim of Mari

Parrot, Mari. II.
PL. XLVII, no. 199

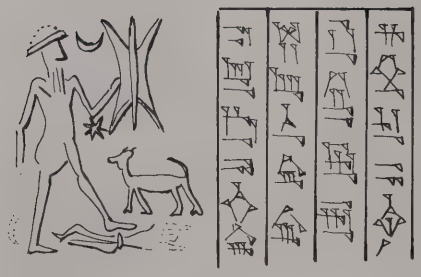
NO. 35 b

Yasmah Adad
of Mari

PL. XLVII, no. 179

NO. 35 c

PL. XLVII, no. 231



NO. 36

Ṣelulu of Ashur
Balkan, TTKY. VII/ 31a,
fig 22/ 23

Selulu of Ashur. Balkan, TTKY. VII/28, fig. 7

⊗ Ibalpiel of Ashnunnah

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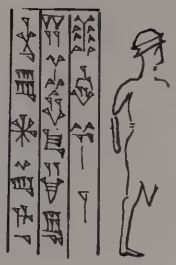

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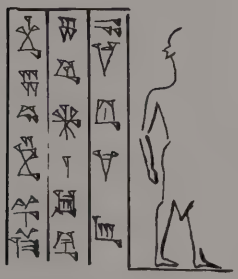

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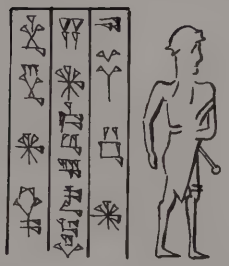

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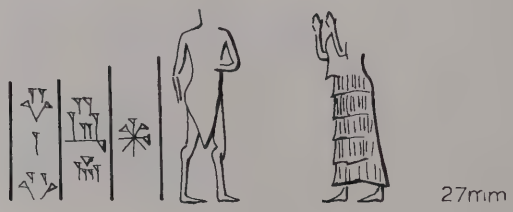
NO. 37. Hammurabi of Babylon Belleten, XIX/75. 1955, fig.32



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NO 38 Hammurabi

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Delaporte, Bibl. Nat. no. 200

Parrot, Mari, II. PL. XLIX, no.193

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NO. 39

Hammurabi, 2nd. year,

Delaporte, Louvre Cyl. II.

PL. 114, fig. 3 b.

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NO. 39 Hammurabi, 10 year
Delaporte, Louvre, II. PL.114, fig. 4

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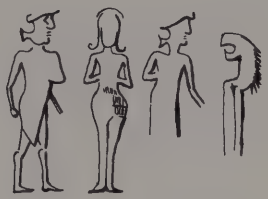

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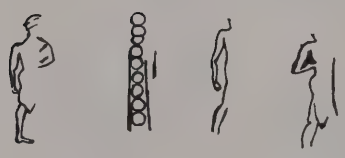
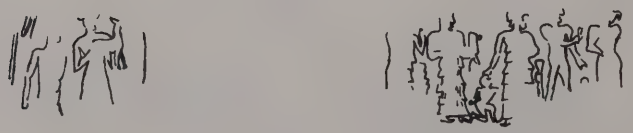
Hammurabi, 13 year
Figulla, VS. XIII,
PL. II, no.18

NO. 39. Hammurabi, 29 year. Ranke, BE, VI. I. PL. IV, no. 7

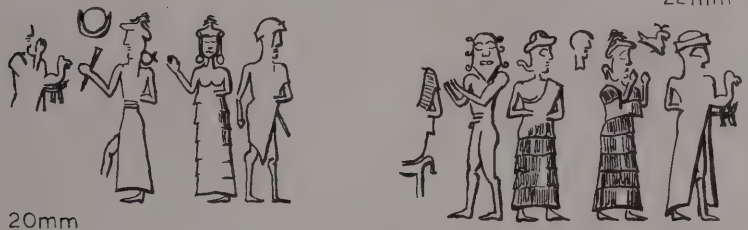
NO. 39 30 th, year
Figulla, VS. XIII, PL. II, no. 20

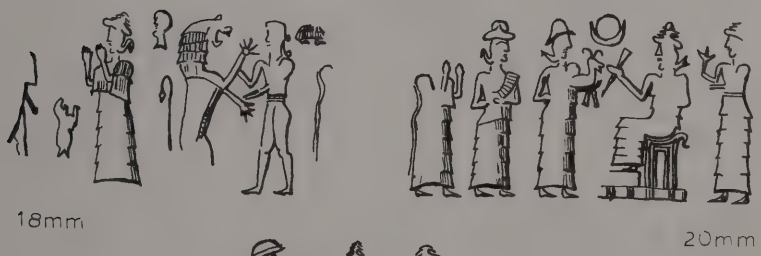




34 th. year, no. 23

NO.39 Hammurabi, 35th year, Delaporte, Louvre Cyl. II
PL.115, fig.1





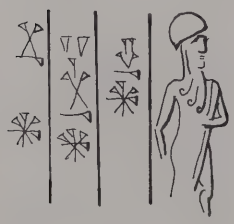
NO 39 Hammurabi 35th year Porada "Impressions from Sippar"

p.125 NO. XXVII

p.129 NO. XXXIV

Hammurchi, 38th year
Ranke. BE. VI, I.

PL. VII, no.II



PL. V no. 8

⊗ Buchanan, Library Gazette,
Vol. 45, Oct. 1970
p. 58. no.8

NO. 39 Hammurabi, 43rd, year Porada, J.N.E.S. 16, p. 195

fig. 3.

fig. 4.

Porada, "Immpressions from Sippar."

P. 117, no. X

Hammurabi Figulla CT XLVII PL 14 no 22

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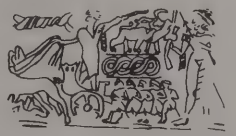

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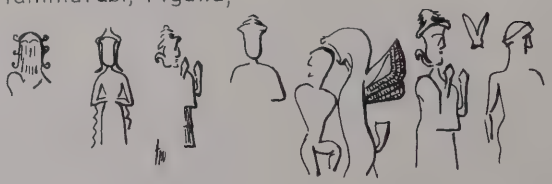
NO. 39 Hammurabi, Figulla, CT. XLVII.



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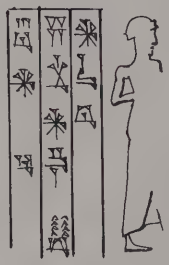

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PL.18 no. 28

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PL. 24, no. 39

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NO. 39 Hammurabi, Figulla, CT. XLVII. PL. 25, no. 40

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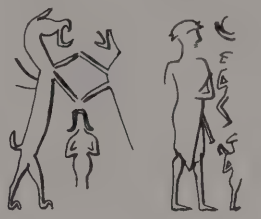

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⊗ Contemporary Hammurabi from Tell al-Rimah PL 109

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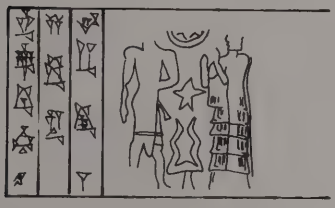

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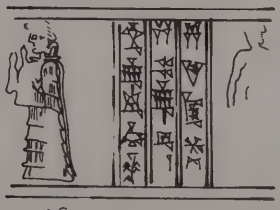

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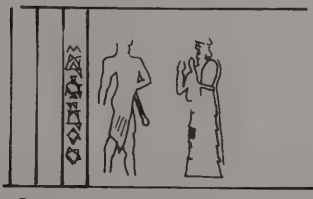

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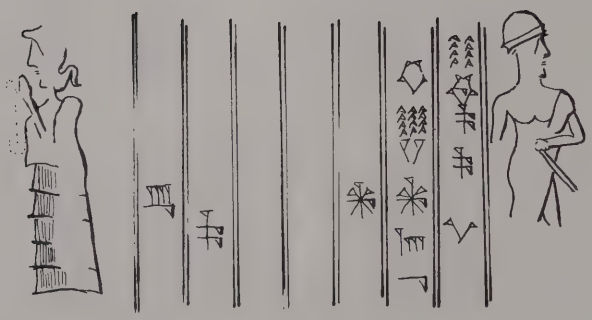
NO. 39 Hammurabi,
Buchanan, Library Gazette,
Vol. 45, Oct. 1970
p. 58 no. 9

NO 40 Zimrilim of Mari Jitta, Cyl. à la Haye, fig. 61

Zimrilim
Parrot, Mari II,
PL. XLVI

no. 166



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NO 40 Zimmrilim Parrot Mari II

PL LVI
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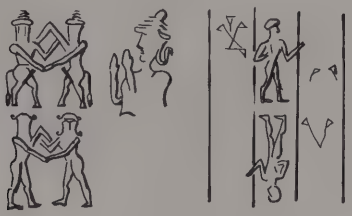


PL. XLII
also Amiet, Syria,
Vol. 37, p. 215
fig. 12

PL XLIX no 244
also Amiet Syria
Vol 37 p 215
fig 1

Delaporte Louvre Cyl. II.

PL. 79, fig. 21
18mm

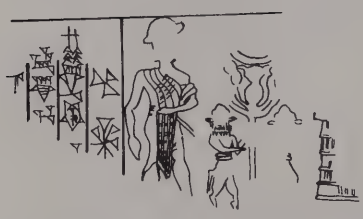
PL. 81, fig. 14
23mm

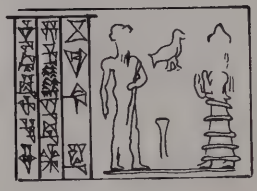
NO 40. Zimrilim, Delaporte, Louvre, Cyl. II PL.82, fig. 13

25mm

NO 40 Zimrilim,
Woolley, Alalakh,
PL. LXIV, no. 75

⊠ Zimrilim Tell al Rimah PL. 108





NO 41 Samsu iluna of Babylon, Scheil, R A, 13. PL.II, fig.13

NO. 42 Samsu iluna,
Buchanan, JCS, 11.
p. 46, PL. I, fig. 7-9

20mm

NO. 43 Samsu iluna year 1, Delaporte, Louvre, Cyl. II., PL. 115

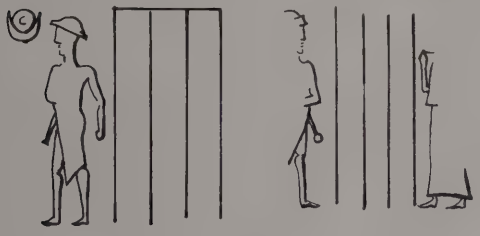


fig. 2

fig. 4 14m.m

year 2. Porada, "Impressions
from Sippar"
p. 116, no. VIII

year 3, Porada, JNES 16,
p. 196, fig. 5

NO 43 Samsu iluna year 4 Delaporte Louvre Cyl II PL115 fig 6

16mm

15mm

year 5, fig. 5

year 5, PL.116 fig. 1

20mm

year 6, PL.115, fig. 3

20mm

year 6, PL.116, fig. 2

15mm

⊠ Samsu iluna year 7

⊗ Samsu iluna, year 7, Buchanan; Library Gazette, Vol. 45, Oct. 1970 p. 58, no. 10

⊗ NO. 43, Samsu iluna, year 7-8, Porada, "Impressions from Sippar"

p. 113, no. III

p. 114 no. V

p. 115, no. VI

p. 114, no. IV

NO. 43 Samsu iluna Delaporte Louvre Cyl II PL 116

20m.m

fig. 6 20mm

fig. 3 16mm

fig. 8 18m.m

NO.43 Samsu iluna, Delaporte, Louvre Cyl. II, PL.116, fig.7

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Samsu ilᵘnq year 10

23mm

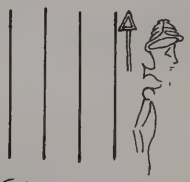
year 11

fig 10

15mm

year 14

fig, 9



22mm

15mm

year 18

fig, 1, PL.117

NO. 43

⊗ Buchanan, "Library Gazette," Vol. 45, Oct. 1970

Samsu iluna year 18

20mm

⊗ Samsu iluna year 23

17mm

⊗ Buchanan, "Library Gazette" Vol. 45, Oct. 1970 no. 12

Samsu iluna year 27

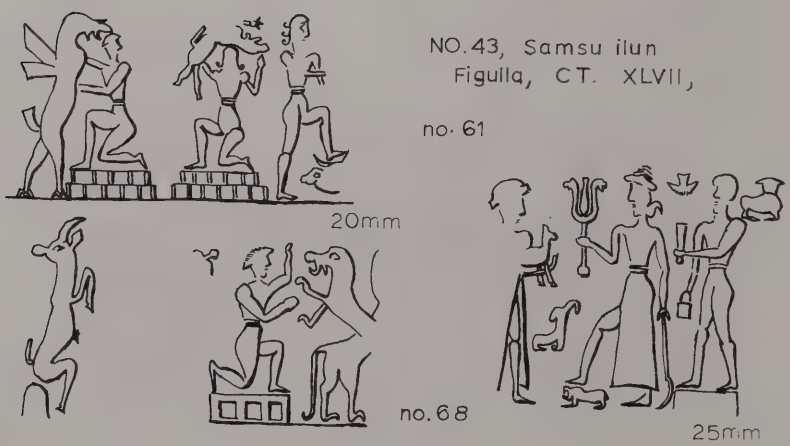
NO. 43, Samsu iluna year 30

Buchanan, JCS. 11, p. 74

⊗ Amiet, Syria, Vol. 37, fig. 8

NO.43, Samsu ilun year 30, Lyon, JAOS. 27. p. 135, PL.I-II

NO.43, Samsu ilun
Figulla, CT. XLVII,
no. 61



NO 44 Abi Eshuh of Babylon Moortgat Rollsiegel no 494

29mm

Ⓐ Abi Eshuh.

Ⓑ Abi Eshuh, Buchanan, 'Library Gazette' Vol. 45, Oct. 1970, p.60

no. 13.

no .14

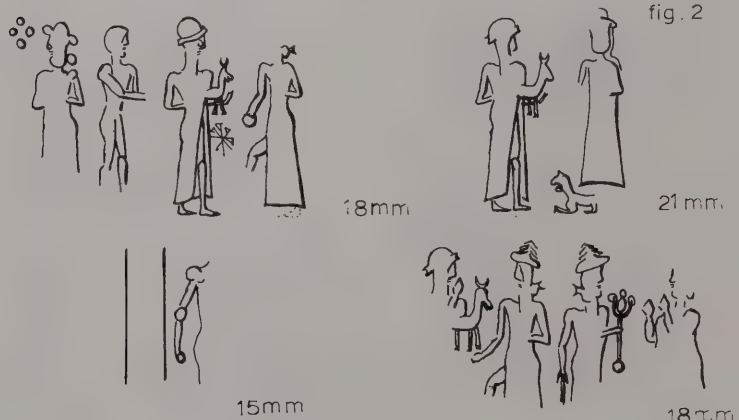
no.15 year 28.

NO 45

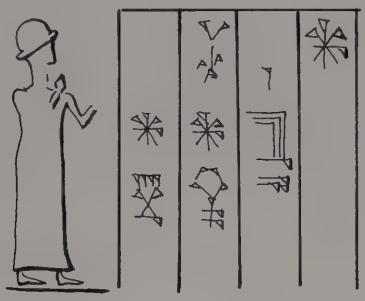
⊠ Ammiditana year 11, Buchanan, "Library Gazette" Vol. 45, Oct. 1970, p. 61, no. 16

⊠ Ammiditana year 6

NO. 45 Ammiditana year 15, Delaporte, Louvre Cyl. II, PL. 117, fig. 2



NO. 46 Ammiditana, Delaporte, Louvre Cyl. II, PL.117, fig. 4



NO. 46 Ammiditana, Ranke, .B.E. VI. I, PL.VIII, no.13

NO 46 Ammiditana Delaporte Louvre Cyl II

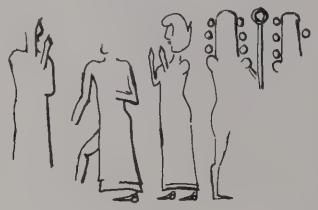
year 3
PL.118, fig.14

year 24
PL.117, fig. 3

15 m.m

NO. 46 Ammiditana year 24, Porada, "Immpressions from Sippar," p.127, no.xxx

NO. 46, Ammiditana, Delaporte, Louvre Cyl. II., PL. 117, fig. 6

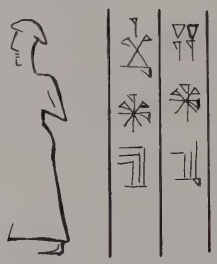


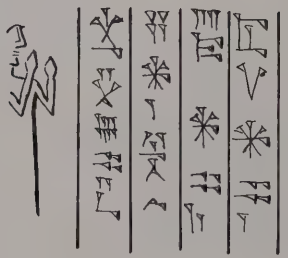
25mm

23mm

NO. 46, Ammiditana, year 37, Porada; "Impression from Sippar
p. 126, no. XXVIII

Ammiditana, Porada, "Impression on Cuneiform Tablet"

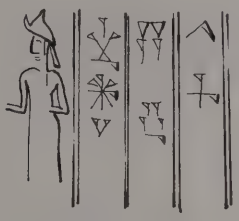


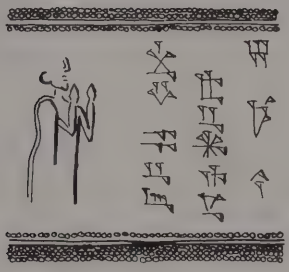


NO.47 Ammisaduqa of Babylon, Moortgat; Rollsiegel, no. 495

22mm

NOS. 48 & 49 Ammisaduqa Ranke, BE. VI, I, PL. X, no. 15





⊗ Ammisaduqa, Buchanan, Yale Library Gazette, Vol. 45, Oct. 1970 p. 62 no. 17

18mm

NO. 50 Ammisaduqa year 2 Delaporte, Louvre, Cyl. II, PL. 117 fig. 7

NO. 50 Ammisaduqa year 16, Delaporte; Louvre Cyl. II, PL.117, fig. 8

21mm

13mm

Ammisaduqa, Buchanan, "Library Gazette" Vol. 45 Oct. 1970

year 16
p 62 no 18

year 17 p 63

no. 20

no. 19

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Ammisaduqa

Buchanan, Ashmolean
no. 551

Ammisaduqa year 2

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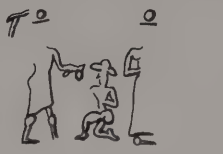

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NO. 50 Ammisaduqa, year 9 Delaporte, Louvre, II, PL.117, fig. 570

18mm

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Ammisaduqa year 11

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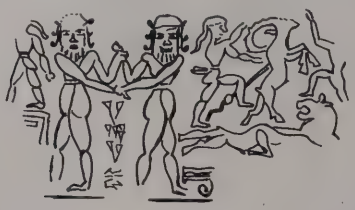
Ammisaduqa year 11

NO 51 Samsuditana, Gordon, IRAQ. 6, PL.IV, fig. 26

NO 52 Samsuditana Buchanan JCS 11 PL II no 11 13



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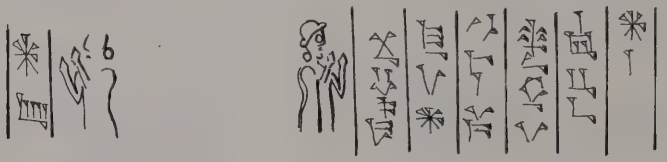
Delaporte, Louvre Cyl. II, PL.117, fig. 9



Samsuditana, Buchanan, "Library Gazette" Vol.45 Oct. 1970

year 13
p. 64, no. 22

year 14 p. 65 no. 23

Sherd Size in the Analysis of Occupation Debris

by RICHARD BRADLEY AND MICHAEL FULFORD

Introduction

The last few years have seen an increase in the sophistication with which pottery assemblages have been analysed. There has been useful discussion of quantitative techniques and quite complex recording systems have been developed (Vince, 1977). Despite the adoption of rather different methods – assessing the sherds by number, by weight, by minimum number of vessels – there has been only limited interest in explaining the different results achieved by each technique, and there has been still less analysis of how this material entered the archaeological record (Evans, 1973; Hinton, 1977; 231–5; Orton, 1975). The purpose of this paper is to suggest that the size of sherds is a variable normally overlooked by these recording schemes. Used carefully, it can shed light on the origin and character of particular deposits. We present two short studies in which this appears to be the case.

There is a growing literature concerned with the processes by which the archaeological record formed, but pottery's potential contribution has been almost entirely neglected. The principal case study pays more attention to worked stone artefacts (Schiffer, 1976), and the most thoughtful literature has been concerned with seeds and animal bones (Dennell, 1972; Binford, 1978). The size of artefacts has attracted little attention, except in the recording of surface finds (Baker, 1978). The few comments which can be applied to ceramics are only briefly stated and have not been tested (cf. South, 1979).

Schiffer (1976) has made a crucial distinction between *primary* and *secondary* refuse, and this distinction is followed in the present paper. Primary refuse is refuse which remains where it is first discarded, and can be used as dating evidence and in tracing the arrangement of different activities. Secondary refuse, on the other hand, consists of material which is removed from the area where it is used, and for this reason is little help in isolating different activities. It is of limited value as dating evidence and can contain a mixture of artefacts from different sources and different periods. Sherd size may shed some light on this distinction. Schiffer has argued that small fragments may remain in the areas in which they are discarded, by being trodden into occupation floors, whilst larger pieces may be collected up and taken away to a midden (Schiffer, 1978; Gifford, 1978).

Vertical patterns

There is some experimental evidence on the way in which sherds fragment. Kirby and Kirby (1976; 236–8) have investigated the breakdown of a ceramic assemblage with a series of controlled episodes of trampling. They emphasise that the process is not uniform through time: the larger sherds have a greater chance of breakage than the smaller fragments and the degree of damage falls off towards a minimum threshold. Their figures suggest that the median diameter of the sherds is roughly the reciprocal of the number of episodes of disturbance. Thus after three 'treading events' the individual sherds are about a third of their original size. This should mean that pottery with a long history of disturbance and redeposition will tend to get smaller through time. In a sequence with a uniform depth of disturbance and a constant wastage rate of pottery one would expect to find an increasing density of sherds, combined with a smaller mean size. This basic relationship can be seen in the Neolithic levels at Knossos (Fig. 1). This calculation omits all figures for layers which have been combined (Evans, 1973). It also suggests that the top layers of this sequence may have been disturbed in later occupation. This emphasises the importance of separating the original process of deposition from the effects of subsequent reworking. This problem is investigated in our first case study.

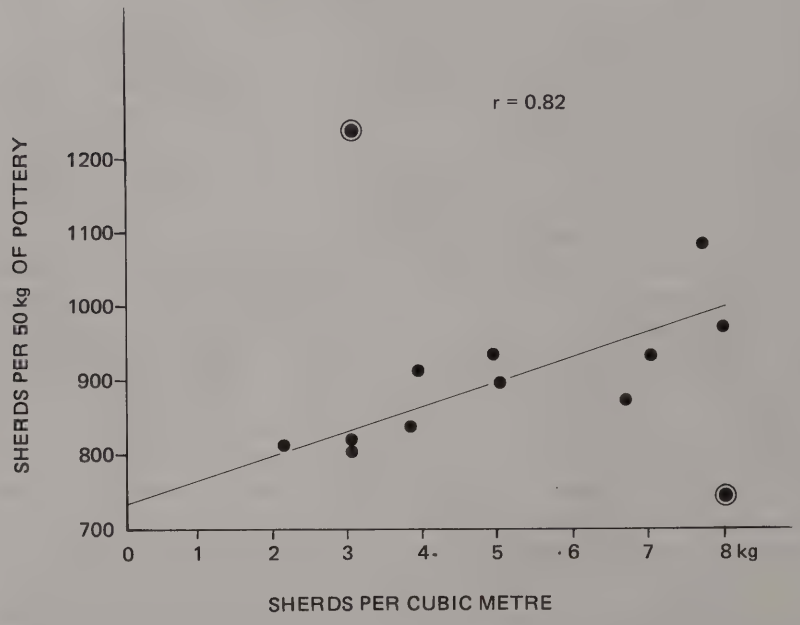


Fig. 1 The relationship between sherd size and the volume of pottery in the Knossos sequence. The two ringed symbols represent deposits at the top of this sequence which could have been disturbed in later activity. They are not used in calculating the linear regression. Data from Evans (1973).

Carthage

The site considered here covered an area outside the city wall built about AD 425. The excavated trench was subdivided by a modern feature, with the result that two independent sequences were obtained. The site included a ditch and other deposits spanning a period from *c.* 525/530 to an unknown point, probably in the 7th century. The pottery in the later part of each sequence is obviously residual and was deposited an appreciable time after the main group of material. Most of this pottery can be separated into three chronological groups according to the date of manufacture:

Table 1

Group 1	*Group 2*	*Group 3*
c. AD 400–450/75	450/475–500/525	500/525–550/575

In the shorter sequence it is possible to trace these groups through a series of five phases, which are dated by pottery. The number of sherds earlier than *c.* 400 or later than 550/75 is too small to warrant analyses. The pottery of the last two phases is indistinguishable from earlier material.

Table 2

Phase	4.2a	4.2d	4.3	6.1	7.1
Date	*c.* AD 540	*c.* 550/575	*c.* 550/575	*c.* 575/600+	*c.* 600+
Size of sample	66	183	84	69	84
Character of deposit	Pit (lower fill)	Pit (upper fill)	Surface/ make up	Windblown deposit	Road metalling

These tables show clearly that the pottery in Group 1 and in most cases that in Group 2 must have been residual when activity commenced on this part of the site. This material may be regarded as secondary refuse. Only the pottery in Group 3 seems to have been made close to the time of deposition. In Figs. 2–3 sherd size is measured by the percentage of rim fragments representing 10% or less of the circumference of the vessel.

The evidence from the dated phases of the sequence is summed up in Fig. 2. It is clear that the difference between primary and secondary refuse is reflected by differences of sherd size. The residual pottery is represented by a separate symbol from the pottery produced while there was activity on the site. The latter material soon broke down to its minimum size and shows little change throughout the whole sequence; but this does not apply to the residual sherds which became smaller through time. The approximate age of the pottery on final deposition is calculated by subtracting the midpoint of the phase of production from that of the phase of occupation. Since this is only an estimate, the linear regression has not been calculated, but it is clear that the residual material shows a fairly direct relationship between the age of the individual groups and the fragmentation of the sherds. If the distinction between primary and secondary refuse could not have been shown from independent evidence, some of the

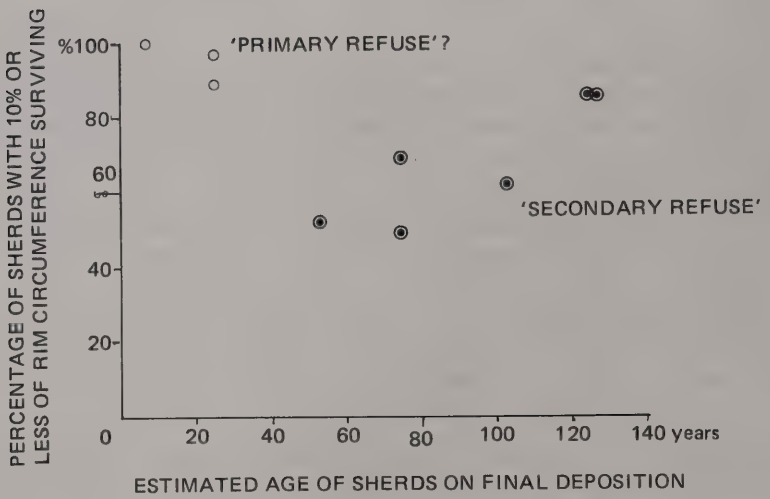


Fig. 2 The relationship between the size of sherds in the shorter Carthage sequence and their estimated age at final deposition. Primary and secondary refuse are treated separately.

larger material might have been dated too late and the sequence of pottery production could have been inverted.

It is now worth considering the longer sequence on this site:

Table 3

Phase	2.1	2.3	5.2	5.5	5.6/7	8.2
Date	525	535	540	575	*c.* 575/600+	–
Size of sample	170	581	176	498	164	114
Character of deposit	Defensive ditch (lower fill)	Defensive ditch (upper fill)	Recut ditch	Second recut of ditch	Tipping above recut ditch and surface	Make up

Phase	8.3	8.4	8.5	8.9	8.13
Date	–	–	–	–	–
Size of sample	337	168	117	274	74
Character of deposit	Building	Layers between construction of building and reconstruction	Rebuilding	Further rebuilding	Robbing and further reconstruction

Here we can include pottery made later than 550/75 as a fourth group.

A substantial part of the sequence again has no dating evidence but it is now possible to use the results of the earlier study to resolve some of these problems. One difficulty in analysing the complete sequence on this site is in deciding the date at which much of the excavated material was deposited. The pottery in the later part of this sequence is obviously residual, but if the size of these sherds diminishes in a regular way it would suggest that

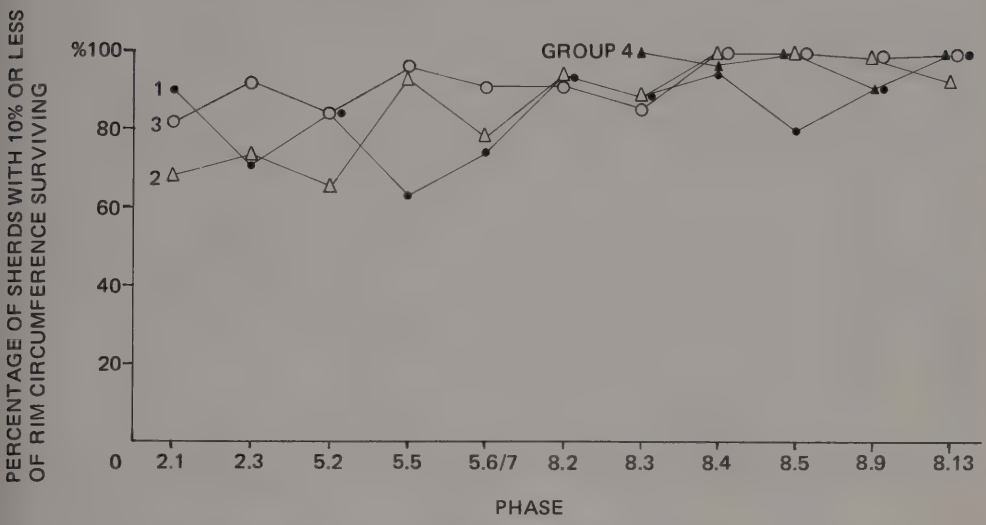


Fig. 3 The size distribution of sherds in the longer Carthage sequence, measured by the percentage of rims with 10% or less of the circumference surviving.

the latest phases follow on without a substantial interval. If, on the other hand, there is a marked difference between the behaviour of sherds in the last dated phases and those in subsequent deposits, there could be a break in the sequence.

Figs. 3 and 4 plot the size distribution of sherds in the four groups. Those with up to 10% of the rim circumference are considered (Fig. 3), together with the smaller number of sherds in the 1–5% range (Fig. 4). The larger grouping shows little sign of sudden change, although it could be argued that a randomly fluctuating pattern gives way to a higher proportion of small sherds in phase 8. Some of these fluctuations may mirror the changing uses of the site (cf. Table 3), but the character of the deposits in phase 8 is not much different from that in the other phases. There is no clear trend in the 1–5% group until phase 8.2, which again sees a marked increase in the proportion of Group 2 and 3 sherds of this size. This also applies to Group 4. The fact that these patterns are the same in phase 8, irrespective of the subdivision of this material, suggests that there *was* a break at this point in the sequence.

Horizontal patterns

Spatial patterns also present problems. Schiffer's argument only distinguishes between artefact sizes in primary and secondary refuse, but on many sites, especially those damaged by cultivation, all the primary refuse has been dispersed and nothing remains except a collection of secondary refuse preserved in subsoil features. How far can

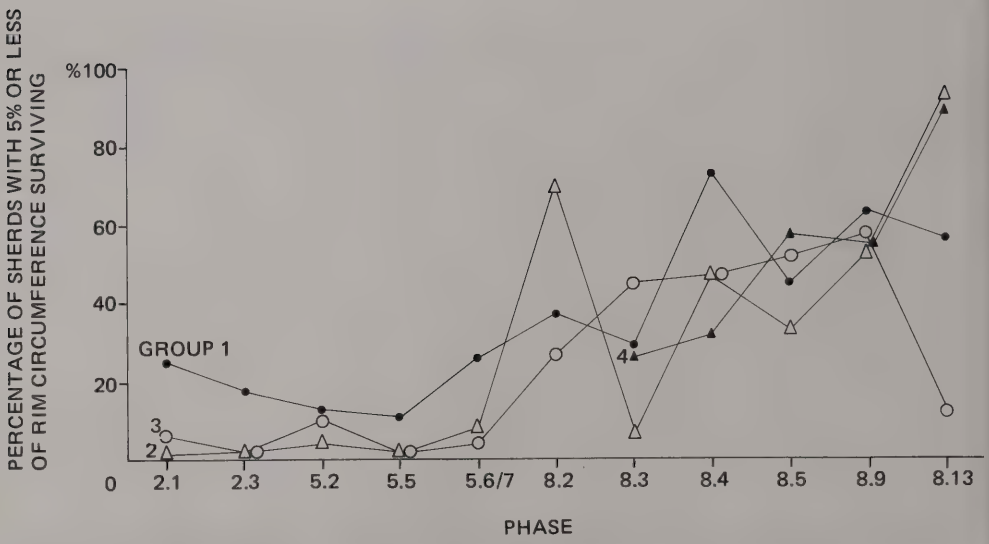


Fig. 4 The size distribution of sherds in the longer Carthage sequence, measured by the percentage of rims with 5% or less of the circumference surviving.

evidence of this kind be used in detecting horizontal patterns? The distribution of sherds among secondary refuse might be simulated using random walk techniques, but even this will fail to account directly for contrasts in sherd size. There are two models which might account for differences of this kind. According to the first approach, contrasts among secondary refuse will reflect different intensities of activity in the midden areas: those parts of the site with the smallest sherds could see the greatest use, even though this activity may not contribute artefacts to these particular deposits. This process will only end when the midden material is buried or when it can break down no further. An alternative is for secondary refuse to be cleared outwards from the areas with most activity, with the result that those sherds which move furthest are disturbed most frequently. Such pieces will break down to a greater extent than those that are buried where they are first discarded. In the first hypothesis the fragmentation of the sherds is related directly to the intensity of activity around the midden; the second hypothesis suggests an inverse relationship, the larger sherds being used closer to where they are found. Clearly the two models will operate differently on different sites, but it has been possible to test them in our second case study.

Aldermaston Wharf

This study is concerned with secondary refuse deposits filling pits and post-holes on a settlement at Aldermaston in Berkshire, dating to the early first millennium bc. The

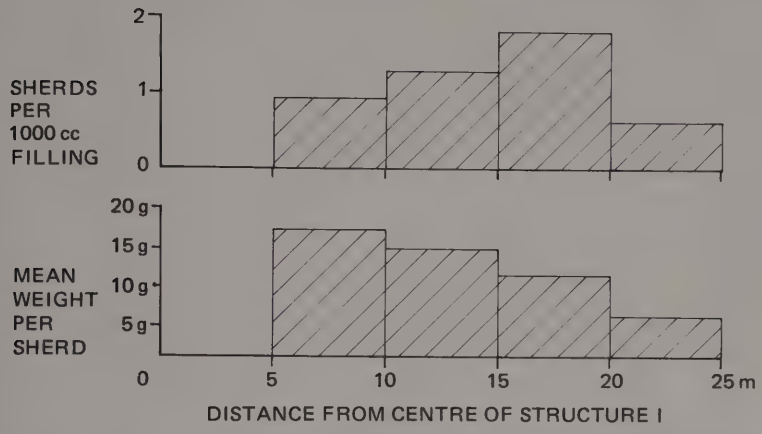


Fig. 5 The mean size of sherds at Aldermaston Wharf plotted against distance from the central building. This pattern is compared with the density of pottery in the separate features, again plotted against distance from Structure I.

site consists of two probable round houses, a pond, and four clusters of pits which were probably used for grain storage before they were filled with settlement refuse. The pit clusters are spaced to allow access to the houses and should be of the same date as these buildings. There is no relationship between the density of pottery in these pits and the size of the individual fragments, but it is apparent that the size of the sherds shows a general fall off with distance from the two houses (Fig. 5). The open ground near to these buildings would be the most reasonable focus for open air activities. Sherd size is measured by the mean weight per fragment within a series of 5 m bands radiating from the centre of the principal building, Structure 1. Since sherds in the same fabric should have about the same specific gravity, their weight should be related to their volume, and similar results can be achieved by considering the different fabrics individually.

There are wide differences in the amounts of pottery in separate features, and this makes it difficult to compare the weight of sherds in particular groups with the exact distance of these features from the two buildings. In Fig. 6 the fall off pattern is limited to assemblages from the pits. There is also the difficulty that not every fabric would be used together in the same area. Despite these problems, regression analysis of one fine fabric group shows a regular distribution of sherd sizes across the site (Fig. 6). This material shows a consistent fall off from one of the houses and may have acted as 'table ware'. On an Iron Age site in Essex similar material is associated with meat bones, rather than kitchen waste (Halstead, Hodder and Jones, 1978). The overall pattern is clear-cut but remains difficult to interpret without an independent source of evidence. Fortunately field tests on soil samples from the bottom of each feature offer some confirmation that the larger sherds *are* related to areas of intensive activity, and phosphate levels fall off steadily with the increasing fragmentation of the pottery.

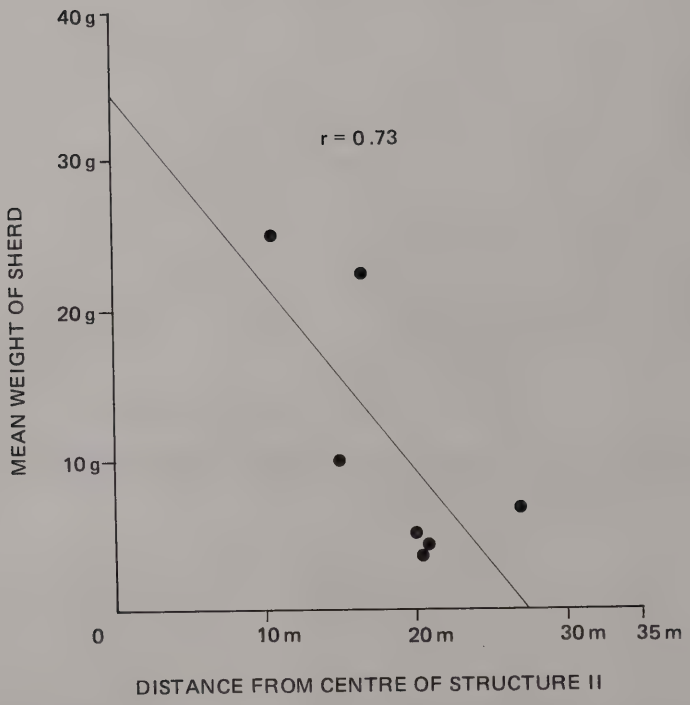


Fig. 6 Calculated linear regression plotting the mean size of fabric G sherds in pits at Aldermaston Wharf against the distance of these pits from Structure II.

Implications

These two case studies are intended to highlight an area for systematic research and do not suggest rigid rules. Instead two practical suggestions arise from these results. First, if a regular gradient of sherd sizes picks out a coherent mode of refuse disposal, it will be worth considering any local clusters of features which contain sherds of similar sizes. If pottery fragments in a predictable manner, then such clusters may pick out groups of material which have undergone the same amount of disturbance. Provided the size of these pieces is above the minimum threshold, this principle would suggest that such material was buried at the same stage of the attritional cycle. At Aldermaston this provides one means of grouping nearby pits where there is no linking stratigraphy (Fig. 7). Secondly, if sherd sizes do provide useful information, how can they be efficiently presented? One answer might be to modify the particle size curve employed in soil science as a graphic way of displaying and comparing information (cf. Shackley, 1975; 98 ff). This does not imply that any particular curve might be unique to one set of circumstances,

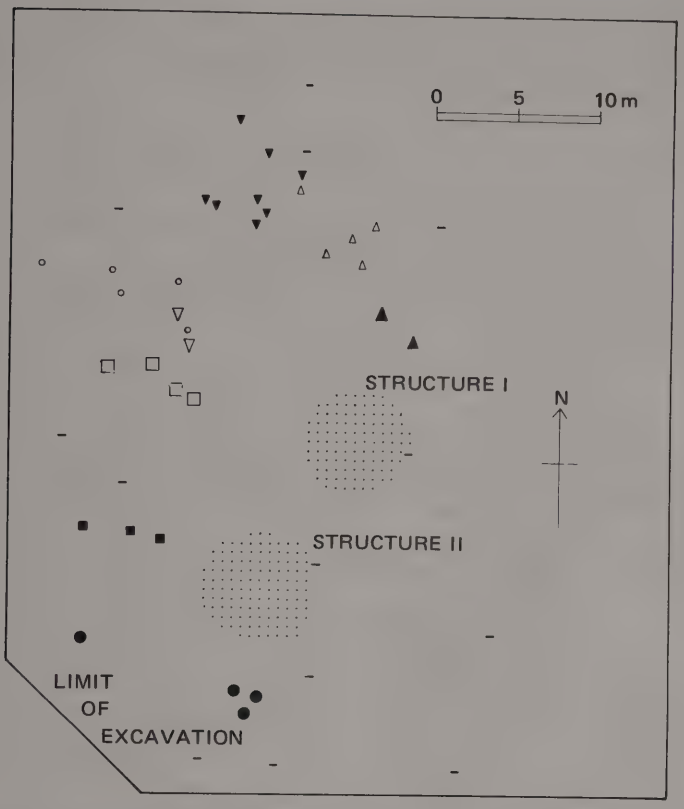


Fig. 7 Outline plan of the Late Bronze Age settlement at Aldermaston Wharf showing groups of features containing sherds of similar mean sizes. The mean weight of sherds within each separate cluster falls within a range of ± 1 g. Pits which do not show this pattern are represented by horizontal bars.

but in a sequence of stratified deposits this technique might provide some warning of the likely presence of residual material. As in both detailed studies, questions of deposition and of subsequent attrition would still need to be treated on their merits.

Acknowledgements

The Carthage excavation was directed by Henry Hurst and the pottery will be published as a monograph. Verna Care and Janet Richardson undertook much of the processing of this material. The Aldermaston excavation was carried out on behalf of the Berkshire Archaeological Unit and subsequent work on the finds has been funded by the Department of the Environment. John Hawkes undertook much of the basic work on the

pottery. The full excavation report is scheduled for 1980. Dr Herbert Pike has kindly advised on the statistical component of the paper. The illustrations are by Joanna Bacon. This paper was first presented at a meeting of the Theoretical Archaeology Group.

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An Investigation of Sub-circular Cropmarks at Grey Goose Farm, Thurrock, Essex

by H. S. TOLLER and T. J. WILKINSON

Introduction

Grey Goose Farm is located *c.* 3 k north-north-east of Grays Thurrock, close to the northern edge of an expanse of Thames gravel terrace (Fig. 1). At this point the terrace topography is relatively level at *c.* 25 m above Ordnance Datum, although it is beginning to slope towards the valley of the Mardyke to the north-west. The excavation took place in an arable field 340 m north-north-east of the farm (NGR TQ 62618104). There was no surface indication of the features excavated.

Attention has been directed to the archaeological significance of the area as a result of aerial photographic survey (St Joseph, 1972; Pl. 24a). Photographs in the library of the Committee for Aerial Photography, Cambridge University, and in the National Monuments Record (Plate I) show that an extensive cropmark complex extends over a large area south of Stifford Clays Road. This road corresponds approximately with the northern margin of the gravel. Several enclosures, both rectilinear and curvilinear in plan, and ring ditches lie close to this road and north of the new road. Over the whole area extends a complicated system of linear field boundaries and trackways intermingled with irregular meandering linear features and a multitude of small subcircular 'pit' features. This study is concerned with the nature of these 'pit' features.

Such features are a common element in a series of cropmark complexes on the gravel terraces of Thurrock, whose distribution is restricted to those areas of terrace gravel which have not been obscured by housing or mineral working. The cropmarks of the area are the subject of a particular study by the Archaeological Section of Essex County Council and a general plan of them has been published (Hedges and Buckley, 1978: Fig. 4; Grey Goose Farm: site C).

The 'pit' features appear generally circular in shape, 3–4.5 m and occasionally 4.5–6 m in diameter. Close inspection reveals a wide range of variation in shape and some can be very angular and distorted. It has been suggested that some may represent Saxon Grubenhäuser on the basis that similar cropmarks occur adjacent to six Saxon settlement sites but other possibilities have also been discussed (St Joseph, 1972: 149). At Mucking, 5 k east, an uncertain proportion of such cropmarks were found to be Grubenhäuser (Jones, 1968: 215). Some of these can be seen to be rectangular on aerial photographs

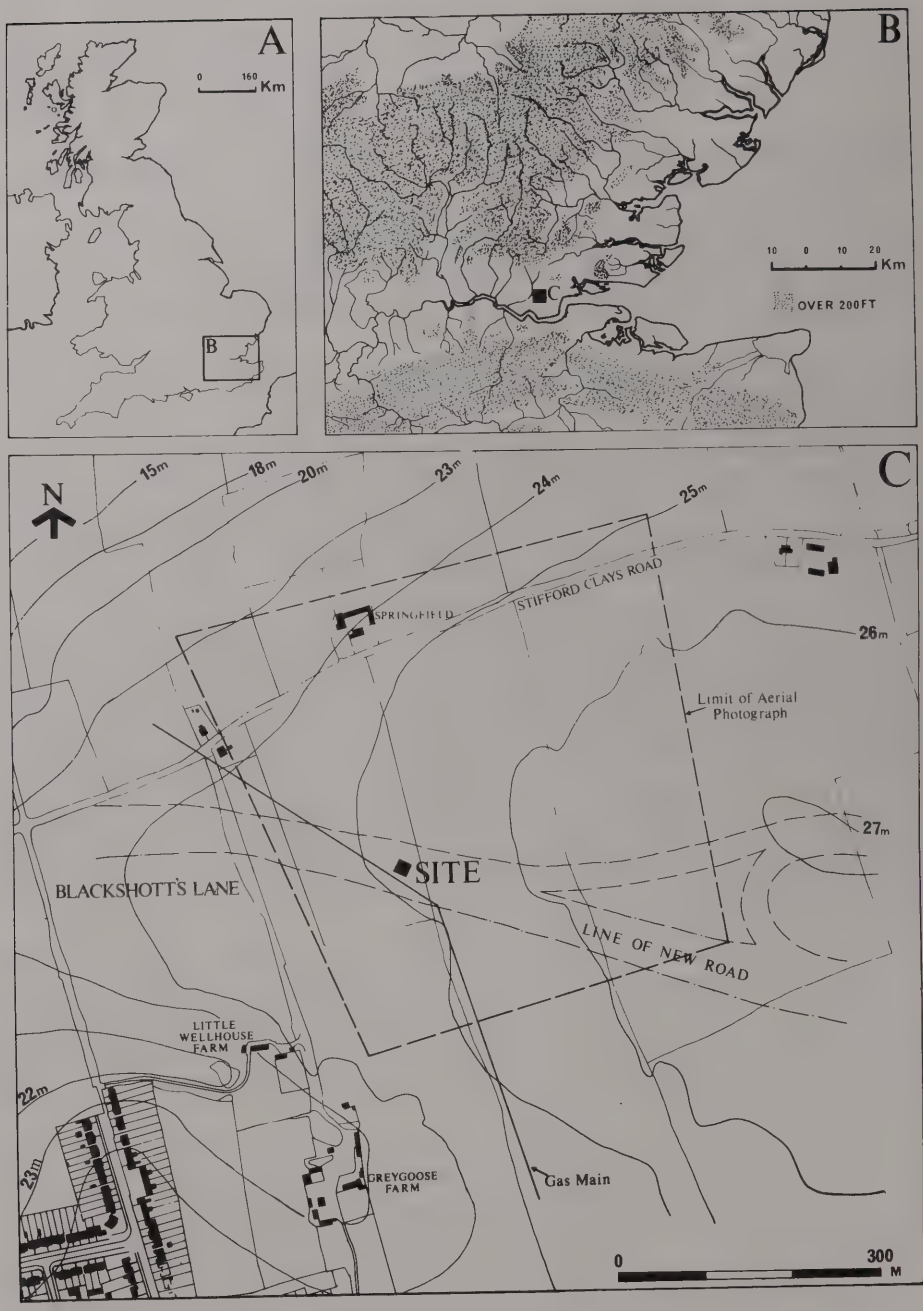

Fig. 1 Site location plan.

Plate I Air photograph of Grey Goose Farm cropmark complex showing excavation site in outline: by permission of National Monuments Record, ref. TQ 6281/10/169.

but they may only be the more substantial Grubenhäuser. At the Orsett 'Cock', 2.8 k east, two of the four Grubenhäuser excavated were found to correspond with such cropmarks, but so also did Roman pottery kilns, Iron Age pits and a circular periglacial feature (Toller, forthcoming).

Hitherto, little archaeological fieldwork or excavation has taken place on the Grey Goose Farm cropmark complex (Essex Sites and Monuments Record No. TQ 68/80). 700 m to the west of the present site the cropmarks of an enclosure were recognised in the area now occupied by the William Edwards Secondary School and were recorded in rescue excavations undertaken during construction of the school. These 'suggested the existence of an Iron Age agricultural settlement followed by Romano-British occupation of a similar nature probably covering the period 100 BC to AD 400' (Bannister, 1963:

37). Three 'pit' features recognised on an aerial photograph have been excavated recently, immediately adjacent to Grey Goose Farm. One could not be defined by the excavators. The other two were interpreted as a post-Medieval pit and a natural feature, possibly a denehole (unpublished excavation: information from A. Saunders, Esq., Thurrock Local History Society: notes and plans with Thurrock Local History Museum). In 1975, a large proportion of the cropmark complex was designated a Scheduled Ancient Monument by the Department of the Environment (Essex Monument No. 174).

Despite the recognition of the archaeological importance of the Grey Goose Farm area, all the preferred routes for the proposed new Grays Northern Bypass Road (A.13) bisected the scheduled area. The most southerly route was chosen as least destructive of the known cropmark features. On this line lay a substantial number of the 'pit' features. The excavation was undertaken by the Essex County Council Planning Department, Archaeology Section, at the request of the Department of the Environment, Inspectorate of Ancient Monuments, and of the Eastern Road Construction Unit in advance of the road construction to determine the nature of a conspicuous circular group of the apparent 'pit' features within the line of the new road.

Prior to excavation, there were a number of possible explanations for the features which were borne in mind:

Archaeological features

1. Pits and localised disturbances as found on many archaeological sites, most notably the bell-shaped and cylindrical storage pits or silos, which are particularly a feature of Iron Age and Romano-British rural settlements.

2. Working hollows, which usually appear on archaeological sites as large dark, irregular features which, on excavation, are found to comprise numerous intersecting pits or a single large, uneven bottomed, and frequently quite shallow, hollow (Smith 1977: 54).

3. Saxon hut sites (Grubenhäuser), which are usually constructed as sunken rectangular hollows with rounded corners. At Mucking, excavation has taken place of the largest group of such huts yet known in the British Isles, which range in measurement from 3.5 m by 3 m to 6 m by 4.5 m and are sunk into the subsoil from 0.25 m to 0.75 m (Jones and Jones, 1974: 23).

4. Deneholes: these are a feature quite common to the Thurrock area, where the north dip slope of the Cretaceous chalk of the North Downs lies close to the surface and is overlain solely by Tertiary Thanet sand and terrace gravel. In general terms a denehole consists of a vertical circular shaft, which is dug through the surface layers and Thanet sand to the chalk. At the bottom of the shaft, large chambers are cut out of the chalk, leaving a chalk roof to the chamber 0.3 to 1.0 m thick (Saunders, 1963: 4). The chambers are usually arranged in a standard plan, known as double trefoil, which would appear to have been evolved as the most efficient plan whereby to extract the maximum amount of chalk and avoid the collapse of the roof (Caiger, 1972). The shaft is filled usually with

material similar to that excavated originally, which may well represent material excavated from adjacent shafts. The upper fill is loamy silt but it can subside unexpectedly because it has not been compacted or even completely filled. This occurs regularly in the Thurrock area, often after periods of heavy rain or extreme drought. The excavated chalk is usually conspicuously absent.

Deneholes are widespread in chalk areas and their periphery, and do occur elsewhere, although it is likely that in the main they were constructed to extract chalk for agricultural and industrial purposes (Smith, 1891: 268). The controversy as to their function is longstanding and continuing, and will not be entered into here (Caiger, 1954). A large group at Hangman's Wood, which average *c.* 21 m in depth, lie less than 2 k south of Grey Goose Farm. Because they have been found to be as deep as 30 m and the geology of the area, which is discussed below, indicated that the chalk may be close to 30 m below the surface at Grey Goose Farm, the possibility existed that the 'pit' features represented deneholes. However, because at least 15 m of Woolwich and Reading Beds lie under the terrace gravel and above the Thanet sand at Grey Goose Farm, this was unlikely.

Non-archaeological features

1. Solution hollows can occur in a similar fashion, where Tertiary deposits overlying the Cretaceous chalk are thin, and dissolution of the chalk can create cavities of some size. These in turn will cause subsidence from the surface and subsequent silting of the hole produced (Limbrey, 1976: 11).

2. Periglacial features: in recent years, complementing the advances in archaeological knowledge from aerial photography, there has also been an increase in knowledge of the structures created during former periods of periglacial climate when the ground was frozen, sometimes seasonally, sometimes permanently. The most common examples of this type of feature are ice wedge polygon casts which are frequently seen as cropmarks, often cut by, or causing confusion in the interpretation of certain archaeological features. These have been scientifically excavated during the course of archaeological excavation and reported upon (Evans, 1972). However, the full range of periglacial features to be found in the British Isles has yet to be examined. Although periglacial 'pit' features, as such, had not been widely recognised, these were included in the range of possibilities prior to the commencement of the Grey Goose Farm excavation, particularly since ice wedge polygon casts were visible on the cropmark photographs.

Given this range of possibilities for the apparent 'pit' features at Grey Goose Farm, trial excavation of a number of the features could be of value in various ways. Should one or more of the archaeological possibilities be correct, this would be of value to the Department of the Environment, Inspectorate of Ancient Monuments, and the County Archaeological Section for the light cast on the main group of archaeological features in the cropmark complex. Equally, should they prove to be deneholes, the information would be of value to the Eastern Road Construction Unit, since these features frequently contain cavities liable to collapse. The same considerations apply should the features

prove to be natural subsidence pockets also liable to subsidence, as confirmed just prior to the excavation by the collapse of such a feature on the A.13 at Clock House Corner (NGR TQ 606799). A concentration of either deneholes or natural subsidence hollows in the Grey Goose Farm area as heavy as the denehole concentration in Hangman's Wood could naturally create considerable engineering difficulties during construction of the new road. Similarly even compaction and load-bearing variations between periglacial features not liable to subsidence and their surrounding areas might have constructional implications.

Geology

The site lies *c.* 400 m south of the north edge of the gravel terrace, which is intermediate between the Taplow (60 ft) and Boyn Hill (100 ft) Thames gravel terraces. Here *c.* 5 m of dense brown rounded gravel and sand is underlain by at least 15 m of Woolwich and Reading Beds, comprising Eocene brown clay, clayey sand and gravel. Below these is at least 10 m of Thanet sand and Cretaceous chalk at uncertain depth. A section along an east–west line, some 3.9 k long through the site from TQ 609805 to TQ 644809, has been reconstructed from borehole information provided by the Eastern Road Construction Unit (Fig. 2; boreholes nos. 364, 370, 373, 380 *et al.*).

The excavation

The trench, 15 m square, was laid out within the roadline to examine a circular group of 'pit' features. On the air photograph (Pl. I: outline of trench marked in white), they appeared to be separate from each other and all to be approximately 3 m in diameter.

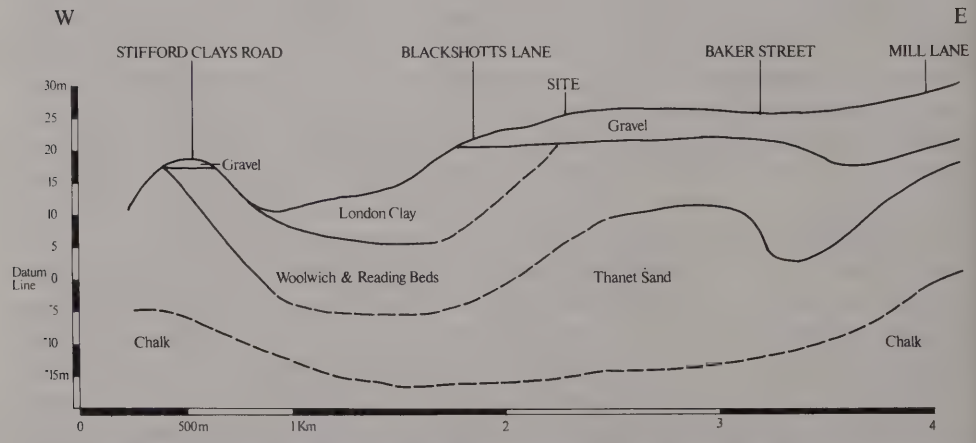

Fig. 2 Geological section from Stifford Clays Road, Stifford to Mill Lane, Orsett reconstructed from borehold information supplied by the Eastern Road Construction Unit of the DOE; uncertain interfaces are dashed.

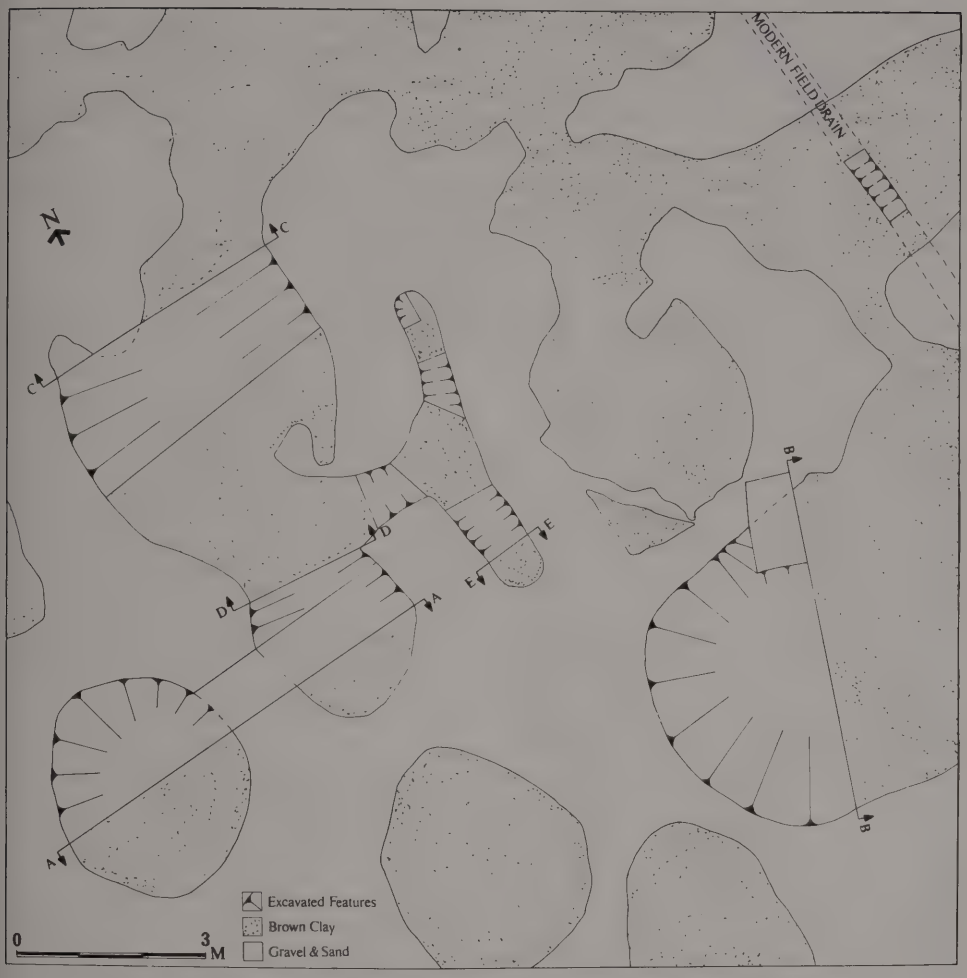

Fig. 3 Plan of cleaned surface after removal of ploughsoil and excavated features.

The layout of the trench was facilitated because differential crop growth above the features in the stubble indicated their position. The ploughsoil was excavated by hand to determine exactly at what depth the undisturbed subsoil lay and to maximise recovery of finds. Selective fieldwalking of areas above this group of features and above the most conspicuous enclosures in the cropmark complex next to Stifford Clays Road had produced few finds and they were all Medieval or later. It was anticipated that finds of earlier date would be scarce and difficult to detect in the ploughsoil.

The ploughsoil was a uniform brown sandy loam with pebbles. Finds from it comprised glazed post-Medieval pottery and tile. It was removed to a level, 40 to 45 cm

below the surface of the field, which was the base of the modern ploughsoil. Below this level, the subsoil was undisturbed apart from one modern field drain in the east corner.

The surface was cleaned by trowelling and it became apparent that some of the features which appeared separate on the air photograph were interconnected (Fig. 3). Comparison with the air photograph has shown that several areas of fine loam (layer 2) are not detectable thereon (Fig. 4). In one case this was certainly because of the shallowness of layer 2 (Fig. 5: section E–E). This was probably also the case elsewhere as at the left hand edge of section B–B (Fig. 5), where layer 2 is in part only 20 cm deep.

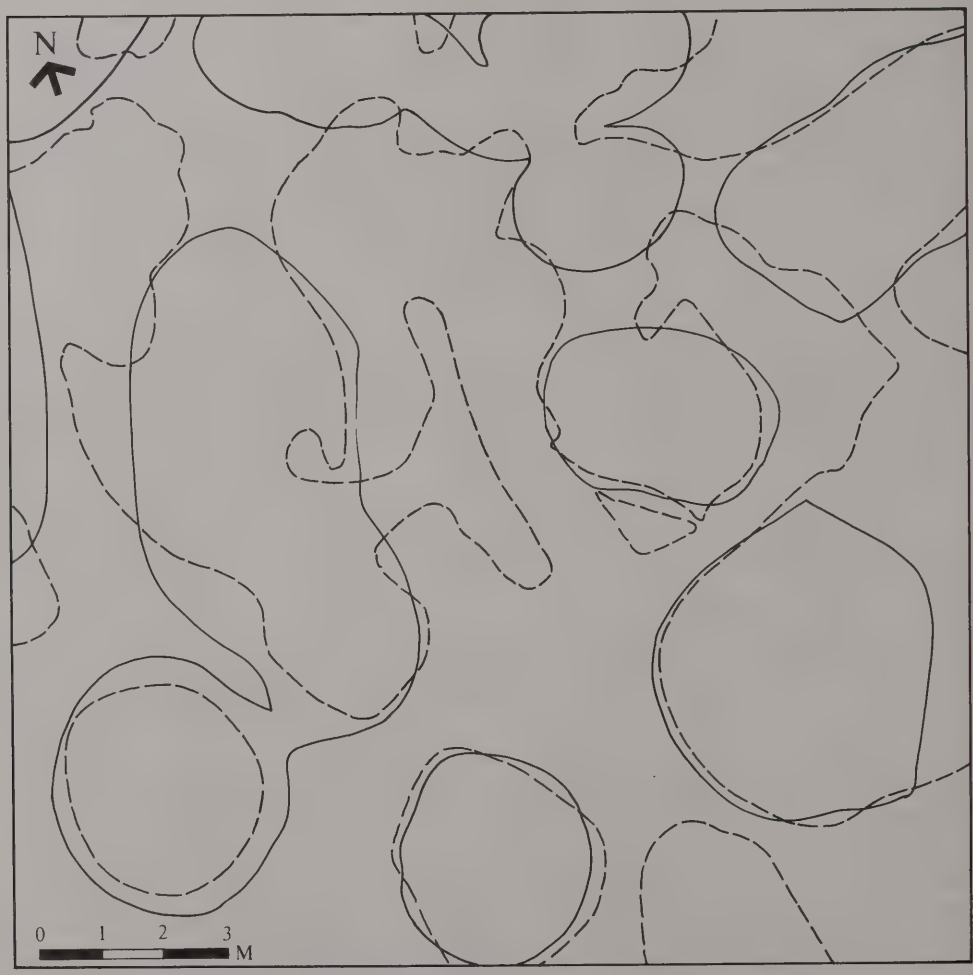

Fig. 4 Comparison between outline of features as appearing on air photographs (solid outline) and as determined on excavation (dashed outline).

The features were selectively excavated to a maximum depth of 2.65 m. A detailed description of the fills arranged by layers related to the illustrated sections (Fig. 5) is set out on pages 104–105 below. The nature of the deposits was demonstrated in two main instances. Section A–A was laid out with the intention of sectioning two discrete features.

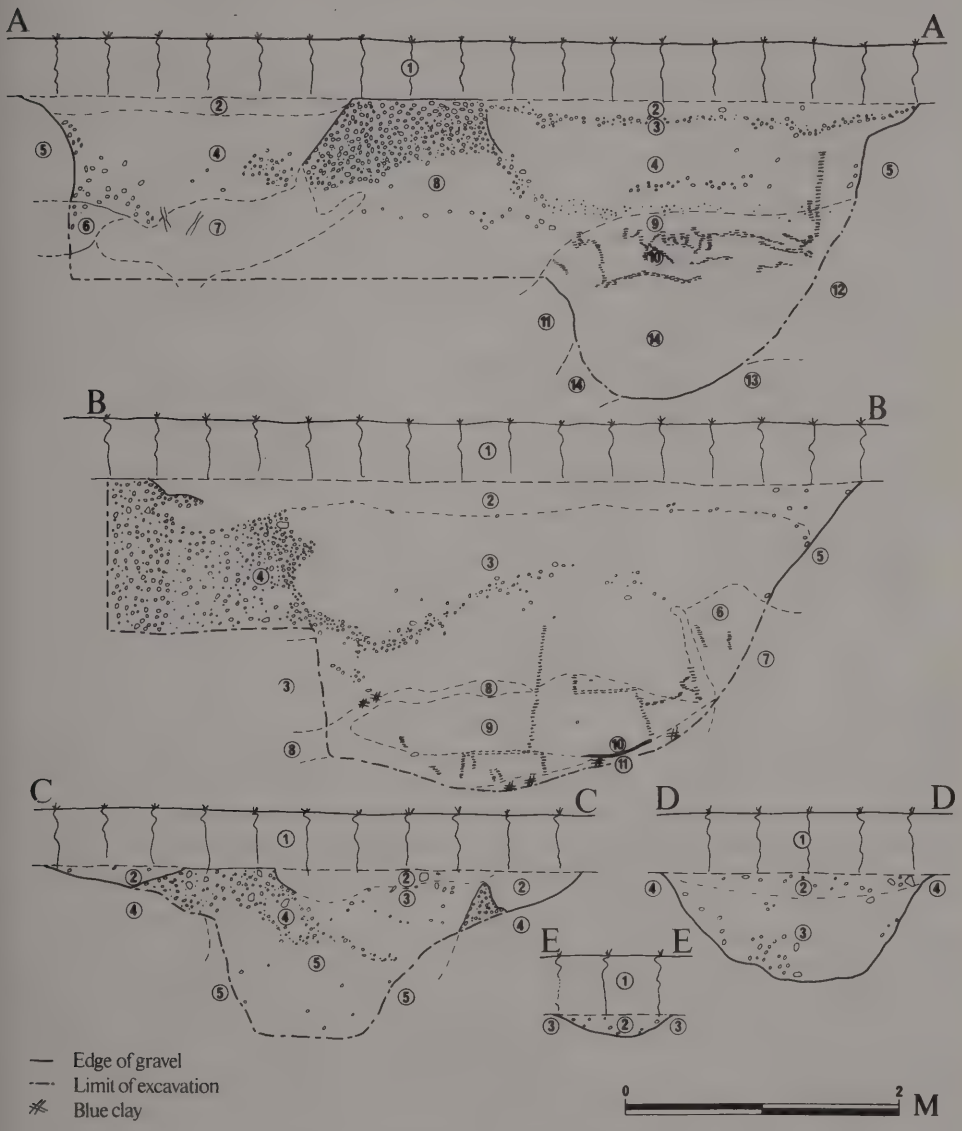

Fig. 5 Sections of excavated features.

Layer descriptions (to accompany Fig. 5)

Section A–A (Plates II and III)	Soil horizon	Munsell colour chart (wet)
(1) Topsoil (removed)	Ap	–
(2) Fine sandy loam, rare stones, moderately firm, very slightly plastic.	Eb	Brown 7.5 YR 5/4–5/6
(3) Sporadic fine–medium gravel up to 3 cm matrix and reddish yellow loamy sand, with some gravel.		–
(4) Firm clay, silty clay and fine sandy clay (similar to (8)).	Bt	Strong brown 7.5 YR 5/6–5/8
(5) Poorly sorted gravel of well-rounded flint or chert stones and some subangular flints up to 4 cm.	–	–
(6) Grey red sand (similar to (7)).	–	–
(7) Slightly loamy sand with rare stones and some pale brown variations; possibly an oxidised iron stained sand which has suffered localised reduction (similar to (6)).	–	Reddish yellow 7.5 YR 6/8
(8) Clay with rare small granules and stones of flint, a little, fine sand, and small patches of clay or very fine silt (similar to (4)).		Light grey 10 YR 7/1
(9) Medium sandy loam, quite rich in clay and plastic containing small white veins.	–	Yellowish brown 10 YR 5/6
(10) Very soft and plastic clay or very fine silt with some fine sand, laminated and lensed: contains – veins of some silty sand (white) with some brown clay rich sandy loam. White material is possibly calcium carbonate ($CaCO_3$) precipitated at depth.	CK	Light yellowish brown 10 YR 6/4 to strong brown 7.5 YR 5/8 White 2.5 YR 8/2 to strong brown 7.5 YR 5/6
(11) Gravel and sand with streaks of blue clay.	–	–
(12) Brown clay with flint pebbles.	–	–
(13) Gravel and sand.	–	–
(14) Fine–medium very sandy clay or fine silt; moderately soft and plastic with occasional flint pebbles (rounded and subangular) and some patches of reddish medium sand.	Cg	Light olive grey 5 Y 6/2

Section B–B (Plate IV)		
(1) Topsoil (removed)	Ap	–
(2) Sandy loam and sandy clay loam with occasional small stones: moderately plastic.	Eb	Dark yellowish brown 10 YR 4/4
(3) Sandy clay, slightly firm and plastic with some grey clay rich patches and rare small stones of *c.* 5 mm diameter.	Bt	Yellowish red 5 YR 5/8
(4) Sand and gravel, with clay-rich patches.	–	–
(5) Sand and gravel.	–	–
(6) Sandy clay: very plastic with occasional white veins.	Ck?	Yellowish brown 5 YR 5/8
(7) Soft medium–coarse sand, apparently well oxidised, with occasional small well-rounded pebbles.	–	Yellowish red 5 YR 5/6
(8) Soft medium sand, moderately well sorted and very slightly dirty; with some patches of blue clay.	Ck?	Reddish yellow 7.5 YR 6/6
(9) Sandy clay, very plastic with occasional white veins.	Ck?	Yellowish brown 10 YR 5/8
(10) Black concretion, probably manganese oxide.	–	–

		Soil horizon	Munsell colour chart (wet)
(11)	Medium sand loamy sand and clay-rich sand with common small pebbles: bright orange mottles in veins and layers towards top of layer and patches of blue clay. This clay contains fragments of wood.	Cg	Pale olive 5 Y 6/4
Section C–C			
(1)	Topsoil (removed)	Ap	
(2)	Very soft, moderately plastic, fine sandy silt loam with rare pebbles.	Eb	Yellowish brown 10 YR 5/4
(3)	Soft, plastic, fine sandy clay loam: variegated, with stones absent.	Bt	Yellowish brown 10 YR 5/6 Reddish yellow 5 YR 6/8
(4)	Very poorly sorted gravel. Stones include flint and chert gravels and angular – sub-angular flint pebbles of all sizes up to 3 cm, with gritty, sandy, clay loam.	–	Moderate strong brown 7.5 YR 5/8
(5)	Very soft, very plastic, very sandy clay loam with occasional small pebbles, and some pale brown patches of clay rich sand: very variegated.	Bt	Very pale brown 10 YR 7/3 to yellowish red 5 YR 5/8
Section D–D			
(1)	Topsoil (removed)	Ap	–
(2)	Yellowish brown sandy loam	Eb	cf. A–A (2)
(3)	Yellowish red sandy clay.	Bt	cf. A–A (4)
(4)	Sand and gravel	–	cf. A–A (3)
Section E–E			
(1)	Topsoil (removed	Ap	–
(2)	Very sandy clay loam with abundant well-rounded pebbles up to 3 cm and some sandy black concretions which cement stones loosely together: probably manganese oxide.	Eb	Yellowish brown 10 YR 5/6
(3)	Sand and gravel	–	–

However it was found that the gravel which separated them on the surface was underlain by layer 8, which connected the two features. The section was extended between them to clarify the picture. Section B–B was intended to bisect one large feature but during excavation of the feature no definite gravel edges could be followed. At lower levels a confusing picture emerged with clay loam and sand fills disappearing into the sides and continuing downwards. Excavation ceased when the sections became waterlogged and did not drain.

The only finds from the excavation, other than 20 post-Medieval sherds from the topsoil, were two fragments of flint-tempered, reduced coarse pottery from layer 2. These are not significant. The finds will be lodged with Thurrock Local History Museum, Grays Thurrock, along with copies of plans and notes (Level III).

The field plans and records will be stored with Essex County Council Planning Department, Archaeology Section, at County Hall, Chelmsford, where the authors can be contacted.

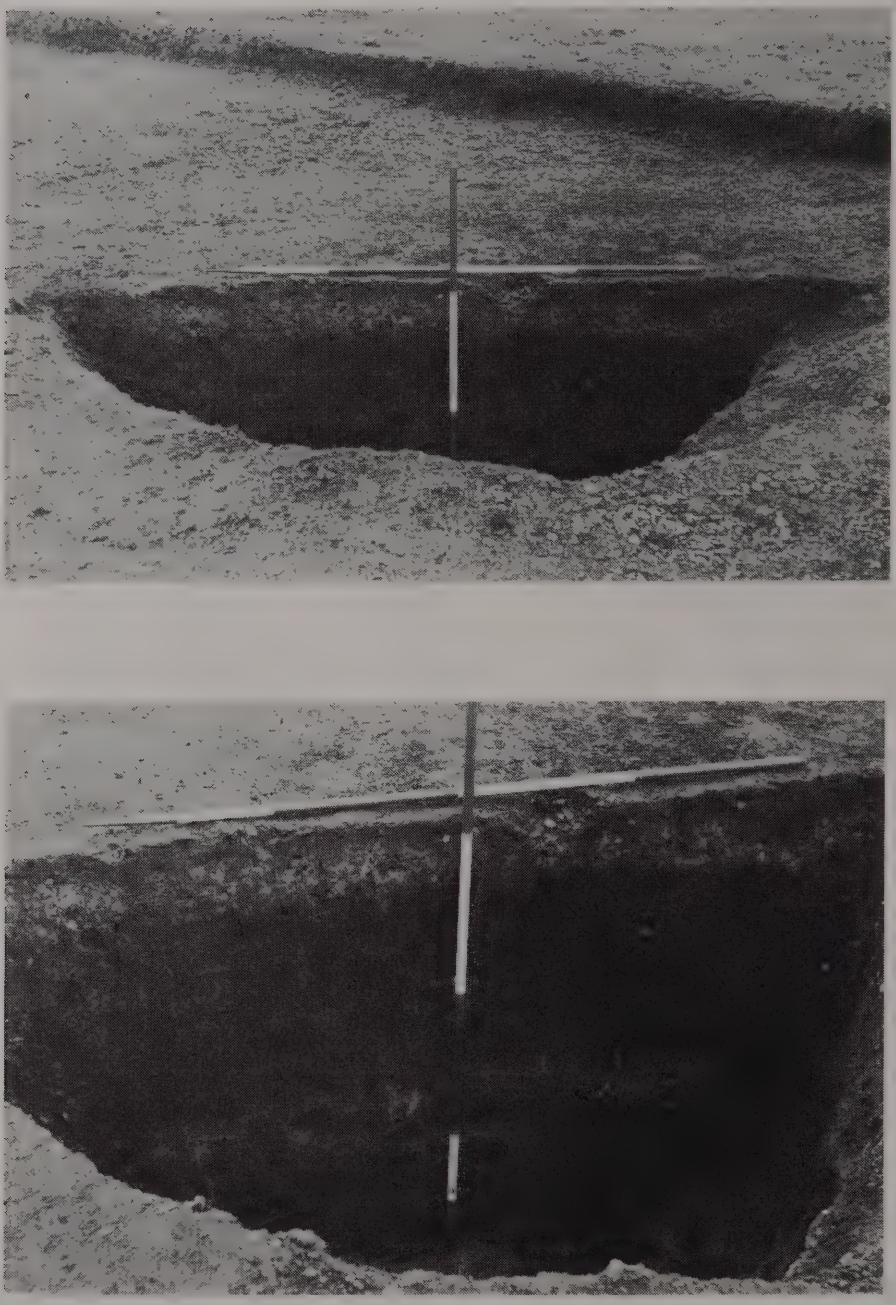

Plate II Section A–A: West End looking south.

Discussion

The evidence from the excavation gave no indication that any features within the trench were artificial, except the field drain. A geomorphological investigation was undertaken to determine the natural origins of the 'pit' features, which had been excavated. The resultant description and analysis of the features follows below. It is suggested that they are non-sorted circles or mass displacement circles resulting from the injection of subsurface material into the surface layer during a period of periglacial cold climate.

It is likely that the majority of the other 'pit' features within the Grey Goose Farm cropmark complex are also of similar origin. The cropmarks of these features must be produced by the natural features described hereafter, because the topsoil is so thoroughly ploughed and uniform that no features survive in it, artificial or otherwise. However, caution must be urged in the interpretation of the air photographic evidence. Although it is very unlikely that there is a Saxon village at Grey Goose Farm of a size commensurate with the number of 'pit' features (Rodwell, 1974: 36), there are certainly a number of rectangular 'pit' features akin to Grubenhäuser recognisable on air photographs at Mucking. The number at Grey Goose Farm is small and a subjective assessment indicated only four.

There is obviously a need for archaeologists to plan and investigate periglacial features (nats.) on archaeological sites in order to elucidate their range of form, origin and distribution. This has been done on the Thurrock gravel terraces at Mucking (Mrs M. U. Jones, pers. comm.), and Orsett (Wilkinson, 1978: 297; Toller, forthcoming).

In September 1979, construction of the new road began along with gravel extraction of an area south of the new road and east of the site. Rescue work is being undertaken by the Archaeology Section (Wilkinson, forthcoming).

DESCRIPTION AND ANALYSIS OF THE FEATURES

by **T. J. Wilkinson**

In the vicinity of the excavations at Grey Goose Farm, two conspicuous types of non-archaeological feature can be recognised on the aerial photographs (Plate I):

1. A large number of linear or zigzag cropmarks; in places these are difficult to distinguish from cropmarks of archaeological ditches which they sometimes cross at oblique angles. These appear to form the remains of an incomplete set of ice wedge polygon casts which result from thermal contraction cracking of the ground under conditions of intense cold. They require permafrost for their formation and for cracking to take place soil temperatures must drop abruptly with a range well below 0°C (French, 1976). Today, for such ice wedges to develop mean annual temperatures must be colder than −6°C. The shape of the pattern can be described as an incomplete, random orthogonal

net. Similar features have been documented for the Thames terraces downstream (Gruhn *et al.*, 1969, 1974) and aerial photographs have revealed casts of ice wedge polygons around Boxted in N. Essex (French, 1976).

2. An extensive scatter of circular cropmarks of variable density. On the aerial photographs, these appear similar in shade to the apparent ice wedge casts although the presence around some of them of lighter coloured rings could suggest that the features are surrounded by a gravel rim (Dr R. Evans[1], pers. comm.). The most strongly developed ice wedge casts occur beyond the zone of circles but circles formed into elongate groups do occur in the vicinity of some apparent ice wedge cast limbs. Furthermore, certain limbs have circles dotted at intervals along their length.

The circular cropmarks appear totally isolated from each other on the aerial photographs whereas those revealed after the topsoil was removed, appear to be linked by bridges of fine sediment. Some 'bridges' as well as smaller features such as E–E (Fig. 5) may be too shallow to register as cropmarks but the exact nature of other links has not been revealed by excavation. To complicate matters, certain features appearing on the photographs are difficult to match precisely with those exposed (Fig. 4). Evans (pers. comm.) has suggested that this is not due to the shallowness of apparent features but that the crop-marks relate to layer 2 and not the clay-rich layer beneath. Layer 2, he suggests, would retain more moisture at the critical depth for crop roots than the adjacent gravels whereas the clays beneath may be out of range of cereal roots (Jones and Evans, 1975). In section (Fig. 5) this layer conforms quite closely to the tops of the features although a difference is apparent at the north end of B–B. As none of layer 2 was removed by the excavators it appears that layer 2 did approximately occupy the tops of features exposed in plan although exact coincidence cannot be expected because of the complications revealed in section. This complexity is well illustrated by the cross sections A–A and C–C in which the sandy gravels which separate the features in plan can be seen to be totally underlain by finer, clay-rich sediments: A–A, layer 8 and C–C, layer 5. Similarly, in section B–B, the sandy clay of layer 3 which in turn is underlain by the sand of layer 8 can be seen to penetrate below the gravel border to the north. This suggests that the features are not clay or silt-filled pits cut in gravel but are bodies of fine sediment which are contorted and convoluted with the adjacent gravels and that only their surface expression is regular.

The complexity of the layers in the vertical plane was emphasised by the sometimes contorted feature edges. These occasionally exhibited a 'feather edge' while in places the adjacent gravels were contorted into festoons characterised by numerous stones with parallel long axes. Such features are normally diagnostic of former 'cryoturbation' (mixing of soil during a phase of periglacial cold climate) and have also been noted by the writer

[1] Soil Survey of England and Wales, Government Building, Block B, Brooklands Avenue, Cambridge.

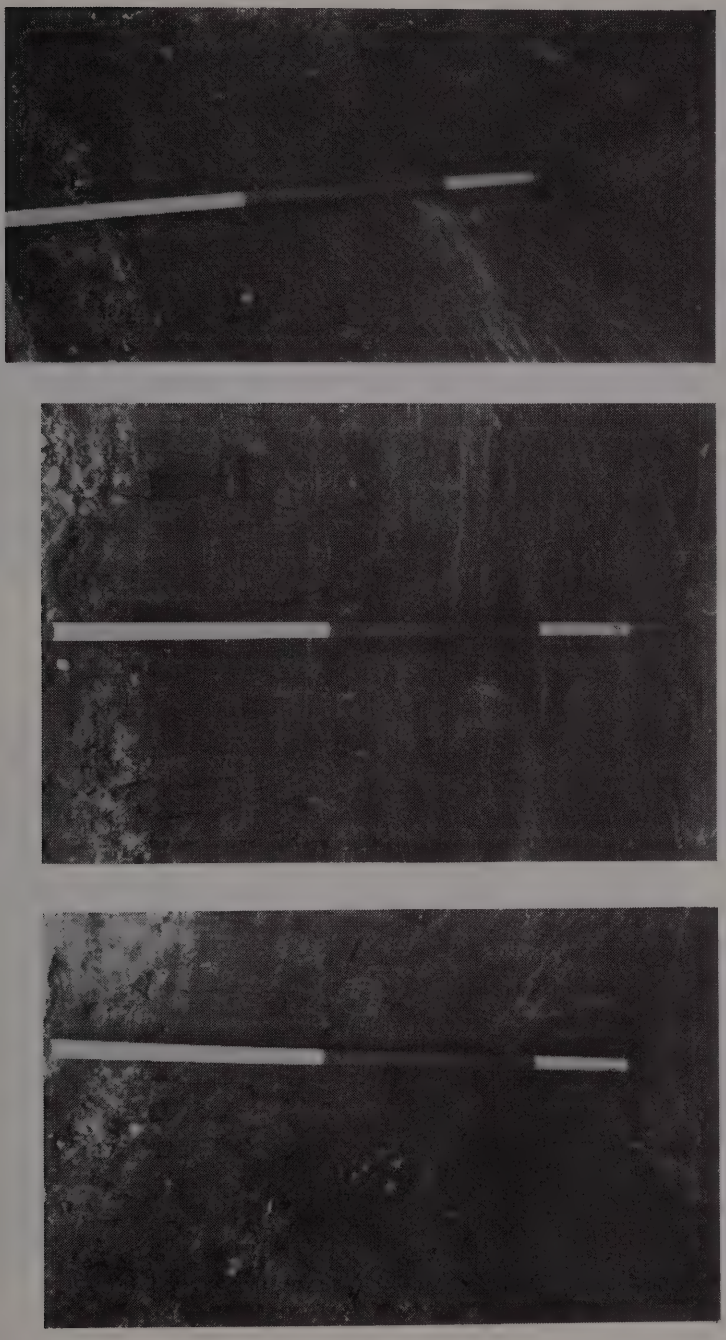

Plate III Section A–A: West End looking south.

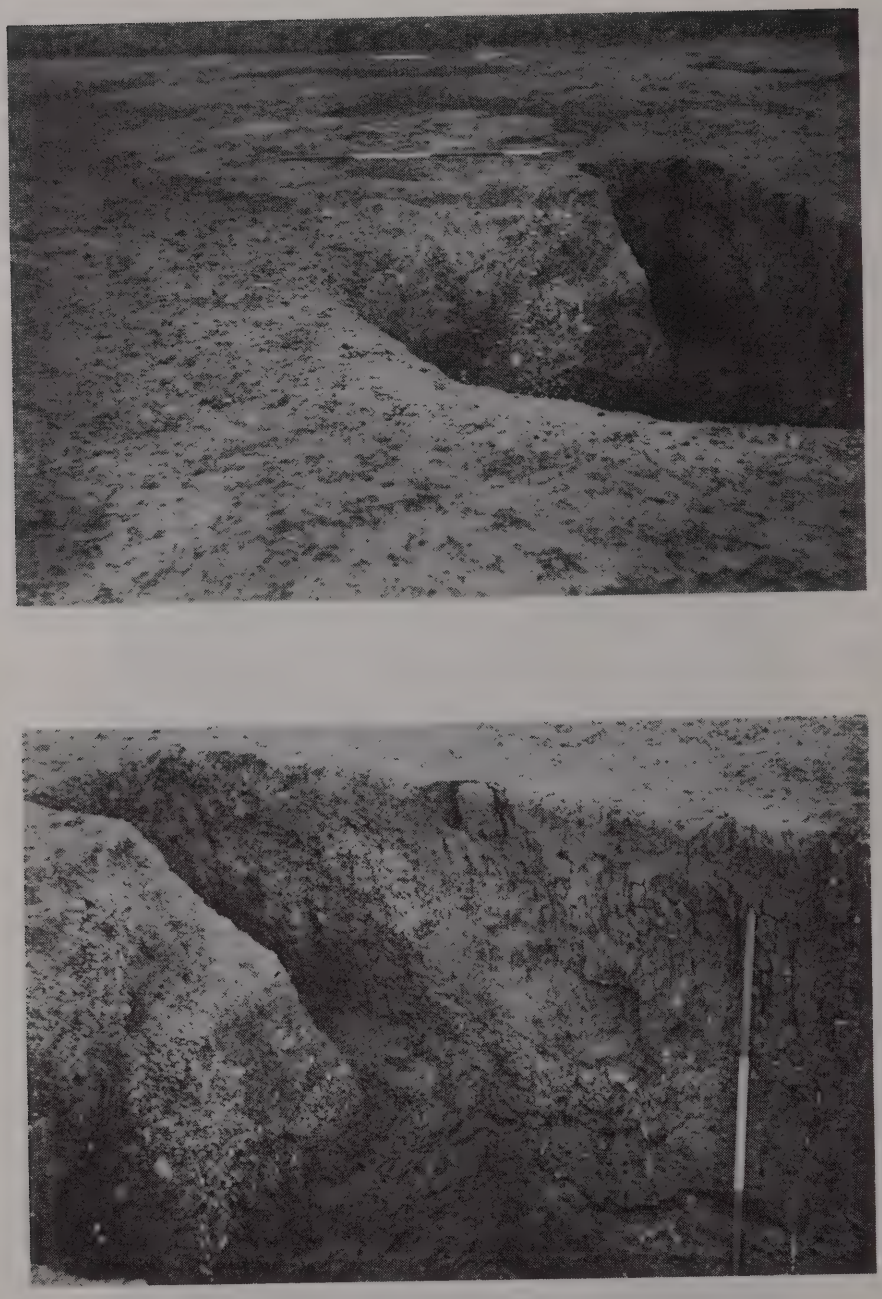

Plate IV Section B–B looking east.

at the nearby site of Orsett on the gravels of the Boyn Hill terrace (Wilkinson, 1978). In addition, at the boundary between layers 3 and 4 in section B–B (Fig. 5) the matrix of the gravel changes from sand-rich to predominantly clay or silt-rich. This suggests that the fine sediments of layer 3 may have been injected by pressure into the adjacent coarse sediments (Plate IV: 2).

In section, the features vaguely resemble periglacial involutions as have been frequently noted in unconsolidated features from elsewhere in the UK (Williams, 1969). These can result from frost heaving which is often associated with the exertion of considerable pressure within the unfrozen layer. An alternative mechanism, not involving permafrost, is discussed below. Also, many types of fossil patterned ground, including regular nets and stripes, have been recorded from sites in the UK (Williams, 1969) but those at Grey Goose Farm, with their variable density of circular cropmarks do not appear in the literature. The closest modern day parallels to the Grey Goose Farm features occur in the Arctic regions and although no identical *patterns* can be suggested, they rather

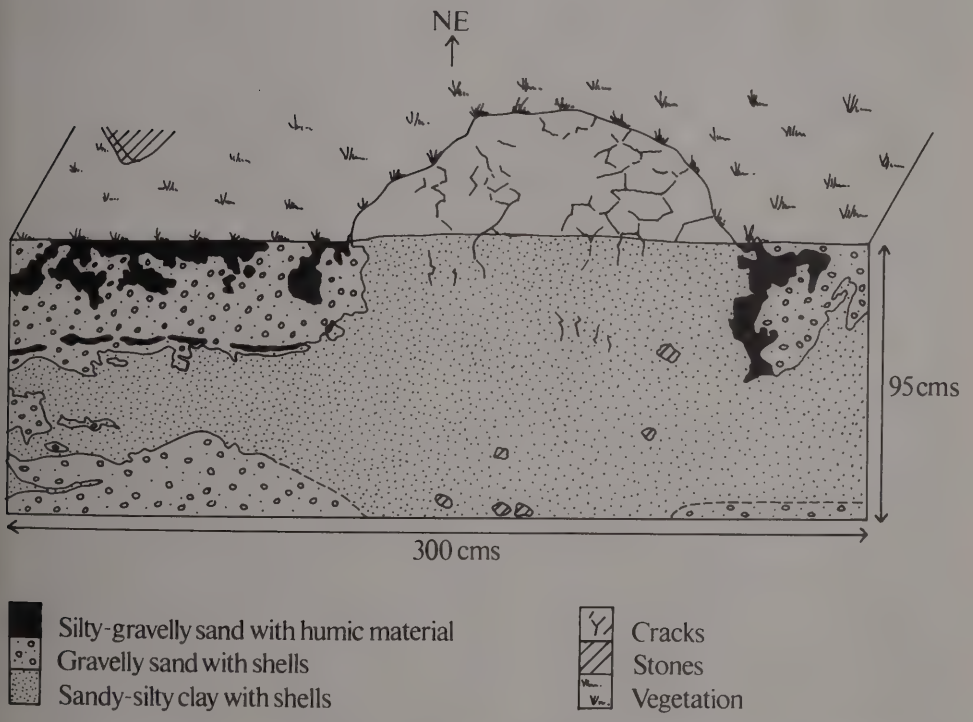

Fig. 6 Field drawing of non-sorted circle from Mesters Vig, NE Greenland: redrawn by Miss L. Monk from Washburn, 1973, Fig. 4.31 (from J. Scully and F. Ugolini).

closely resemble non-sorted circles or mass displacement circles (mud boils) in the classification of Washburn (1956) (Fig. 6). He has described them as follows:

'Non-sorted circles are patterned ground whose mesh is dominantly circular and lacks a border of stones. They are characteristically margined by vegetation and occur singly or in groups. Common diameters are 0.5–3.0 m. The central areas tend to be slightly dome-shaped and cracked into small non-sorted polygons. Most occur on nearly horizontal surfaces' (Washburn, 1973).

Good examples of these non-sorted circles have been recorded from the Mesters Vig area of north-east Greenland and one section is illustrated on Fig. 6 (from Washburn, 1973). This shows how the clear geometric patterns visible on the surface become more chaotic with depth until the fine sediments appear to form an irregular, discontinuous lower stratum.

Non-sorted circles result from 'the injection of subsurface material into the surface layer' during a period of periglacial cold climate (French, 1976). They may be the result of a simple hydrostatic build-up of pressure during the freeze-up period when unfrozen ground exists between the surface and the permafrost table. In this cryostatic hypothesis the wettest and finest sediments are the last to freeze and pressure is released if these sediments can move upwards towards the surface (French, 1976). This injection of finer sediments into a surround of coarse material depends upon pre-existing differences in the sediments and does not involve the mechanical frost sorting of coarse and fine materials. Significantly, at the boundary between 3 and 4 in B–B (Fig. 3), the presence of a silt/clay matrix may result from such a process of mass displacement. Mud boils, 1.5–3.0 m in diameter, similar to those noted by Washburn, have been observed by the writer in low-lying areas of meadow tundra on Devon Island in the Canadian High Arctic. In addition, smaller frost boils were seen to be aligned along limbs of ice wedge polygons developed on raised beach gravels. Such an alignment along former ice wedges may have produced the beaded pattern visible along some of the apparent ice wedge cates on Plate I.

For the formation of frost boils it is required that the fine sediments originally occurred within or below the gravels and were subsequently squeezed up. The coarse sediments are alluvial gravels but the finer sediments forming the features are either flood plain sediments or wind-blown deposits (for details, see layer descriptions below). In the case of flood plain deposits these would normally be expected to overlie the gravels and both flood loams and loess have been reported above gravels in the neighbourhood of Southend (Gruhn *et al.*, 1969). As can be seen in sections A–A, B–B and C–C this 'normal' sequence appears to be reversed and it can be suggested that the features result from the unusual occurrence of fine sediments underlying a thin skin of gravel. This stratification may not be uniform however across the entire area and possible variations in the thickness of either the fines or the gravels may explain the absence of the features from some areas.

Although permafrost is necessary for the formation of frost boils the presence of gravel beds overlying fine sediments can, under the right circumstances, result in the deformation of the underlying beds into involutions. These circumstances would most

likely prevail during or immediately after a periglacial cold period when ice contained within the fine sediments would melt to produce a soft, possibly supersaturated sediment of low bearing capacity. This could lead to the intrusion of the upper by the lower beds to produce involutions which, in the horizontal plane, might have a certain regularity. As these circumstances can follow the melting of permanently *or* temporarily frozen ground they do not necessarily indicate the former existence of permafrost although the presence of ice wedge casts at Grey Goose Farm and its neighbourhood does suggest that this did prevail since the deposition of the terrace gravels.

The Sediments (Fig. 5)

Sediments exposed in the sections are described under layer descriptions; all soil descriptions are qualitative and are based upon samples taken from the sections. In general, the circular pit-like features consist of fine sediments: sandy loam, sandy clay loam and sandy clay, but one or two irregular lenses and layers of sand and loamy sand occur as layer 7, A–A and layers 8 and 11 in B–B. Gravel with a sand or loamy sand matrix with occasional sand layers forms the 'pit' walls and also separates adjacent 'pits' (e.g. layer 3, A–A and layer 4, B–B).

Since the original deposition of the sediments and their subsequent modification by periglacial activity or loading more subtle features have resulted from processes of soil formation. The soil horizons distinguished can be summarised as follows:

Ap This horizon was removed to expose the underlying undisturbed 'natural' sediments. Layer 1, A–A to E–E.

Eb This appears structureless in the photographs. It was brown to yellowish brown and the texture varied from sandy loam to sandy clay loam. Layer 2 A–A to E–E.

Bt This was redder in hue (strong brown or yellowish red) and possessed a finer texture (silty clay or sandy clay) than the overlying horizon. The most conspicuous characteristic is the strongly developed medium prismatic structure (the column-shaped units in A–A, layer 4 and B–B, layer 3). This horizon resembles a B horizon with its higher clay content than the Eb horizon. This suggests that clay might have been removed from above and deposited to form this horizon of clay accumulation (Bt) but the textural difference may be merely a product of the original sedimentary layering. Section A–A, layer 4; B–B, layer 3; C–C, layers 3 and 5; D–D, layer 3.

CK? Below the B horizon in A–A and B–B at depths greater than 1 m occurred an horizon of variable texture containing numerous white veins (A–A, layer 10 and B–B, layer 9). These were soft and plastic and varied in texture from fine sand to clay. They may result from decalcification of the overlying

horizons and the subsequent accumulation of calcium carbonate at a lower level in the soil.

Cg This was the lowest horizon distinguished and its olive colour probably results from gleying produced by seasonal or long-term waterlogging. This leads to the exclusion of oxygen from the soil and results in the reduction of iron. The occasional bright orange colours are probably a product of periodic oxidation in patches or cracks within the soil. A–A, layer 14 and B–B, layer 11.

The distinctive texture of the Eb horizon (layer 2) might result from wind deposition subsequent to the periglacial activity rather than clay removal. Today the stratum is discontinuous and confined to the tops of the features. The soil profile developed within these features can be described as an argillic brown earth ('sol lessive') with gleying at depth but because of the numerous textural discontinuities present not all of the horizons can be the result of soil-forming processes.

To conclude, although pipes and other circular features have been described from the Thames and Evenlode terraces (Arkell, 1947) none quite resemble those described from Grey Goose Farm. Chronologically the features discussed could date from either the last or the penultimate glacial periods (the Wurm/Weichsel or the Riss/Saale periods). If layer 2 is taken to be a wind-blown deposit dating from the last glacial period, as has been suggested for an aeolian deposit found near Southend (Gruhn *et al.*, 1969), and the deposit post-dates the periglacial activity then the circular features could be assigned to the penultimate glacial period (Riss, Saale or Gipping). The evidence for this is open to interpretation, however.

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Abstract

A regular arrangement of subcircular cropmarks was excavated. Although apparently separate from each other, they were shown on excavation to be interconnected. It is suggested that they were periglacial in origin and were formed by a hydrostatic build-up of pressure during a period of freezing within the Pleistocene. A layer of fine sediments above the permafrost and underlying the surface gravel was the last to freeze. The expansion inherent in freezing injected these sediments into the overlying coarse sediments to form regular mass displacement circles.

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Periodisation in the Central European Bronze Age

by VACLAV FURMÁNEK

(*translated by* Anthony F. Harding)

Everyone knows that one of the basic attributes of matter is time. Time in space is also one of the quantities utilised in the study of archaeological cultures. In a positivist conception of prehistory, questions of time are disproportionately emphasised to the detriment of the study of the essence of ancient society – the study of the basis and super-structure of ancient human communities. In the philosophical category of time as comprehended in the historical process, the chronological division of history has its own place. Chronological division divides historical events into shorter segments according to an initial criterion of division which is closely dependent on basic methodological, theoretical and ideological principles of the comprehension of history. For 'periodisation' in the archaeological sense, the words of Jaroslav Böhm, written more than 24 years ago, are still valid (1953: 2–3):

> Periodisation means the separation of the historical process into smaller periods according to certain indicators contained in and selected from its development. Every periodisation has two kinds of aspect, one material, concerned with its content, the other theoretical and philosophical. The first means that periodisation is an aid to the differentiation of the complicated mass of known facts, their classification and ordering. In this case periodisation is a working aid, a tool for mastering, surveying and presenting the continuous flow of historical action. In the second case, periodisation is the expression of an idea by which the historical process is reviewed, and according to which the hallmarks dividing the flow of history into smaller temporal segments are chosen. And it is precisely the selection of these hallmarks that proceeds from the philosophical attitude of the observer and is the manifestation of his evaluation of historical action; this in turn is determined by the education, origin, situation and interest of the observer and his social and temporal condition; in other words it is a manifestation of the world view of the observer. In archaeology periodisation was originally significant in the first instance as an aid for ordering and classifying.

In essence, then, the fact is that in the recognition of prehistoric society it is not *what* is produced that is so important as *how*, the industrial resources with which production takes place, the level on which the productive forces lie. Leaving aside the history of general archaeological periodisation, that is the history of the Three-Age periodisation system, we can turn directly to the problems of the periodisation of the Bronze Age in central Europe, particularly in the northern part of the Carpathian Basin and the areas geographically and culturally adjacent to it. Proceeding from the short theoretical justification of the materialistic conception of prehistoric events that has just been provided, we can say that the Three-Age periodisation system, as well as other analogous or more thorough-going systems, are incapable of showing the socio-economic development of prehistoric society. Of course, in dialectical association with this statement we must realise that periodisation systems of this sort are absolutely necessary for the closer definition of the time during which the development of archaeological cultures took place.

For the study of our particular problems Reinecke's system is one of the most important. Reinecke (1899, 1901) was concerned with the chronology and periodisation of the Hungarian Bronze Age even before the formulation of his classic system of division of the south German Bronze Age. He proceeded mainly from the numerous hoard finds of bronze objects, for grave and other find associations were at the time effectively non-existent. Some decades subsequently, Hänsel (1968: 8, Fig. 1) made a synoptic arrangement of these hoards into a detailed synchronisation table. The Reinecke periodisation system as worked out for the territory of Hungary today has only a historical value. Of more moment, and indeed still in use today, is his chronological system worked out for the periodisation of the Bronze Age in southern Germany, which, with various modifications to which I shall allude, is in use over a wide area of central Europe. (The great majority of Slovak and some Hungarian archaeologists use it, to speak only of those scholars who work on the specific territory under investigation.) Reinecke (1900, 1902) started to publish this system from 1900 on; he then summarised his ideas in 1924.

He divided the Bronze Age into four phases, Br A to Br D, some of which he defined further. The Br A phase he subdivided into A1 (Gaubickelheim–Neuenheilingen) and A2 (Trassem–Langquaid–Tinsdahl). The Br B phase he called the earlier south German Tumulus Bronze Age and, although he did not subdivide it, he assumed that in the future it would be subdivisible into more phases – which is what in fact happened. The Br C and D phases (called the late and final Tumulus Bronze Age) did not last particularly long according to Reinecke. While he did not subdivide Br D, he separated Br C into two subphases: C1 (Göggenhofen–Leibersberg) and C2 (Reisenburg–Asenkofen–Hammer). In this connection it is necessary to introduce further Bronze Age specialists who, proceeding from Reinecke's chronological system, modified it. These were especially Willvonseder, Holste and Torbrügge.

From the standpoint of relative chronology, the work concerned with the problems of the Middle Bronze Age in Austria is to this day of importance (Willvonseder, 1937). Its value rests above all in the fact that Willvonseder worked out a division of Reinecke's period Br B into two phases, defining the content of each. The division of the period Br B

into two parts was somewhat different from the present day conception of phases B1 and B2 (Willvonseder, 1937: 236–61). He asserted that B1 is only the first stage of the main or fully developed period Br B (B2) and lasted only a short time (Willvonseder, 1937: 242). His division and to some extent also his conception of phase Br B1 is fully justified, although as Holste stated (1936: 318) we must reckon with the survival of bronze objects of Willvonseder's phase B2 into the next period, that is into phase C1.

At present the question of the divisibility and content of the later part of Reinecke's period Br B and the earlier part of Br C is very much alive and under discussion. These problems are pressing, and we meet them also in the unravelling of the chronology and synchronisation of archaeological cultures in the northern part of the Carpathian Basin. There, if scholars use the Reinecke periodisation system, as a rule they do not mention whether they are using it in the original Reinecke form or whether they are proceeding on the somewhat modified Reinecke system as created by Willvonseder, Holste and Torbrügge. There is also a problem in that in this area (and in practice in all neighbouring areas too) there are no very conspicuous chronological and synchronisational elements from this period, as there are, for example, in Br B1 or Br D. Conspicuous archaeological events are lacking: there are relatively few bronze hoards; grave groups are as a rule poor and uniform; the archaeological cultures were in an evolutionary stage of development, and contacts with the more evolved east Mediterranean civilisations were negligible.

What is usually understood today by the term Br B, is what Holste (1938) worked out as his so-called Lochham horizon. His scheme for the Middle Bronze Age starts precisely with this Lochham horizon. Only later did this scholar distinguish it with the symbol Br B1 (Holste, 1953: 33). The phase Br B2 follows on from the Lochham horizon. Holste gave Göggenhofen as the outstanding find group of this phase (1953: 21). There follows from this a clear identity of Reinecke's phase Br C1 and Holste's phase Br B2. Further there follows from this the identity of Reinecke's Br C2 and Holste's Br C. Torbrügge (1959a: 14, Fig. 2) provided a detailed analysis and schematic illustration of this synchronisation problem. In this connection it is necessary to stress again that the division of phases Br C1 and C2 has nothing whatever to do with the original Reinecke phase Br C, but is connected with his phase Br B.

But when Torbrügge (1959a: 10) broadened the Lochham horizon somewhat and united Holste's phase Br B2 both with Reinecke's Br C1 and at the same time with his own newly defined Br C1, he in effect interfered with Reinecke's line of division between Br B and Br C. Torbrügge (1959a, b) worked out the precise material composition of phases Br B, Br C1, Br C2 and Br D on the basis of material from grave groups. Beside this he created a Bronze Age chronology following from the content of bronze hoard finds. Comparison of both chronological series for the Middle and Late Bronze Age is as follows: grave phase Br B compares with hoard phase Br B; Br C1 with Br C; Br C2 with Br C/Br D; and Br D with Br D (Torbrügge, 1959a: 57).

Many scholars (Kemenczei (1968), for example) do not use the original Reinecke division of individual phases of the Bronze Age, but prefer the Holste and Torbrügge improved system. Of course, for the synchronisation of various phases of the Bronze

Age in the way that different scholars have worked it out for different areas, their user must indicate very precisely what he understands as coming under which phase. As a rule this does not happen, a fact that is usually a stimulus to keen (and in fact completely useless) chronological discussion; or else it leads unwittingly to the mistaken drawing of chronological conclusions, which are published in a completely different sense from their original one.

In assessing periodisation schemes it is necessary to be familiar with Gordon Childe's system (1929). Today, it is true, we look at it only from the standpoint of the history of periodisation systems that have been used for the relative chronology of the Bronze Age in the Carpathian Basin, but it does represent the start of independent periodisation schemes for the central part of the Carpathian Basin. Childe proceeded from the results of the several-metre-deep settlement layers at the tell sites of Pecica, Periam and Tószeg. He worked out four phases, which he called Tószeg, A, B, C and D. But in view of the fact that bronze objects appear on these tell sites very rarely, Childe had to use material from bronze hoards and cemeteries as well in working out the material content of the individual phases. It was here, with the utilisation of the funerary material, that basic errors were bound to arise, for at that time closed find groups effectively did not exist. Childe used the entire available material from a relevant cemetery, not realising that almost all the cremation cemeteries start at some time within Br B1 and have a remarkably long lifespan. Nowadays Childe's periodisation system is not used.

Tompa (1935), too, proceeded from the sequence of layers at Tószeg and excavation at Füzesabony in the formulation of his periodisation system. Like Childe, he too created four Bronze Age phases. The dividing lines between his phases do not tally with Childe's, however. Tompa assigned the end of the last phase, Tószeg D, to the so-called period of the Scythian incursion. It was undoubtedly the later finds, left on the uppermost levels of the tell but after a definite break in occupation, that led him to this erroneous conclusion. Tompa's system is not used either, nor is Nestor's division of the Bronze Age (1932: 82), although his division of one part of it, the Otomani culture, has a significance even today.

Milojčić (1953) drew attention to the differences between the Childe and the Tompa chronology in his lecture on the matter at the Zürich Congress of 1950, in which he directed himself to the problems of the chronology of the Hungarian Bronze Age. On the basis of Foltiny's material he succeeded in synchronising the pottery from the mouth of the river Morava in Jugoslavia with layers of the tells at Tószeg and Pecica. He worked out six phases, whose importance is vital for the unravelling of the chronology of the Bronze Age (principally the Early Bronze Age) (Milojčić, 1953: 275, Fig. 42). In his work stress is laid (correctly) on the question of the end of settlement at Tószeg and the beginning of the Urnfields, as well as on the end of fortified settlements in general. The work of Točík (1956, 1960) is also significant mostly for questions of chronology and periodisation of the Early Bronze Age.

In his later work, Milojčić (1959: 73–5) assigned representative find groups or even whole localities from various parts of the Carpathian Basin to individual phases of the

Reinecke–Willvonseder–Holste–Torbrügge periodisation scheme. This step was, from the point of view of the needs of foreign scholars who overwhelmingly used the Reinecke chronological system, most acceptable. Foltiny's synchronisation system is also helpful and does not complicate the situation. Foltiny (1955) did not create his own chronological phasing, but contented himself with assigning individual archaeological cultures and groups to the corresponding phases of the existing Reinecke chronological system.

For the relative chronology and synchronisation of the Bronze Age in the Carpathian Basin the control excavations at Tószeg, the results of which were published by Mozsolics (1952), had great significance. She also reduced Childe's four-phase system to a three-phase one, and named the individual phases Nagyrév, Hatvan and Füzesabony. Three phases represent the autochthonous development of the Hungarian Bronze Age. After that, according to Mozsolics, the development of the indigenous Bronze Age archaeological cultures ceased, an effect brought about by the incursion of the Tumulus cultures. Mozsolics (1957, 1972) divided the succeeding Bronze Age development into a further three phases, IV–VI, which can be synchronised with phases Br C to Ha B of Reinecke and Müller-Karpe. Together with this division Mozsolics worked out a parallel relative chronology of the bronze industry on the basis of characteristic hoard finds. She also published the archaeological material and an archaeological–typological examination of the first four horizons (Mozsolics, 1967, 1973). These horizons she named Hajdúsámson, Kosziderpadlás, Forró and Ópályi. They also represent the first four phases of the Hungarian Bronze Age. In some cases, however, these are only very narrow horizons which do not always comprehend the whole development of the period in question without omission. In the synchronisation of these horizons with Reinecke's chronology and also with the absolute chronology, marked incompatibilities arise, as many scholars in various connections have remarked (Hänsel, 1968; Čujanová-Jílková, 1974). This fact manifests itself especially clearly in the Koszider horizon, which directly touches on the problems of the origin of the Piliny culture, the Suciu de Sus culture, the Tumulus cultures, and others. At first sight it is clear that hoards of the so-called Koszider horizon as Mozsolics published it are not a horizon in accordance with the terminological significance of the word. It is a question of hoards whose duration is relatively long. Hänsel (1967) some time ago pointed this out in connection with the publication of the bronze hoard from Hodonín. If we wish to synchronise the hoards of the Koszider horizon in Mozsolics's conception with the Reinecke chronological system and arrive at absolute dates for them, we get into a situation that is both embarrassing and hard to resolve. According to Mozsolics, this horizon ends in phase Br B, which she dates to 1300 BC. This is not only her opinion, but the prevailing notion in Hungarian Bronze Age archaeology, and is supported by carbon-14 dates (Kemenczei, 1975: 331). At the same time, however, some other Hungarian scholars date the Koszider horizon to the 14th century BC, and according to carbon-14 to 1330 ± 60 BC (Kovacs, 1975: 316). This dating, supported as it is by exact particulars, attempts to produce a semblance of conviction; of course the carbon-14 dates available from cremation graves of the Piliny culture in the cemetery of Radzovce are still earlier.

If Mozsolics speaks of the phase Br B in connection with the Koszider horizon, we come up again here against the problem of the differences in understanding of this phase, and consequently one cannot express oneself in terms of synchronisation. If, on the other hand, we take into account the absolute date given (1300 BC) and the undoubted reality that the end of phase Br D is unequivocally datable to 1200 BC (Müller-Karpe, 1959), only 100 years would be available to us for phases Br C – Br C2, if one prefers – and Br D. This is a quite short length of time, although in general it is maintained of Br D that it comprises only a relatively narrow segment of time. Of course Mozsolics further distinguishes an earlier phase of Br D which is identical with the Ópályi horizon, and a later phase identical with the Aranyos horizon (Mozsolics, 1972: 379, 382–3). Recently, Kemenczei (1975) has examined this division and come to the well-founded conclusion that in the northern part of the Carpathian Basin it is not possible to separate two independent horizons of bronze hoards within the period Br D.

The chronology which Bóna offered (1958: 222, no. 50) also proceeds from the stratigraphical results on tell settlements. His Middle Bronze Age, divided into three phases (1–3), is practically identical with the phases Br A to Br B1. In contrast to Mozsolics, though, he assigns the end of the autochthonous archaeological cultures of the Hungarian Bronze Age to the earlier period. After the Middle Bronze Age there follows in Bóna's system the Late Bronze Age, divided into two phases (1–2), after that the so-called Transitional phase and then, in period Ha A, the Velatice culture in the western part of Hungary. In a certain sense the Bóna chronological system meant a definite progress as against the Mozsolics system. Like Milojčić, he too ends the existence of the Füzesabony (Otomani) culture in phase Br B1. His opinion that the tell settlements die out in the course of phase Br B1 is also an advance. In connection with this chronology, too, a space was created for the gradual 'invasion' of the Tumulus culture, as Bóna supposed it to be. Of course, in the synchronisation of some bronze objects from the Carpathian Basin with artefacts from other areas Bóna did come to erroneous conclusions, which appeared most markedly in the dating of the Koszider horizon (Bóna, 1958).

Proceeding from the foregoing chronological systems for the Bronze Age that had been worked out for the Carpathian Basin, and principally from the periodisation work of Milojčić – and of course from any material remains of a substantial nature – Hänsel (1968) created his own chronological system. In his formulation of the system Hänsel took into account four basic conditions, according to which every periodisation system must logically express the outlines and flow of historical development, in essence it should supersede an absolute chronology, it must have consideration for existing periodisation systems – especially for the periodisation systems of the immediately neighbouring lands – and its formal expression must proceed from archaeological concepts already in use. Hänsel took as the basis for the formal expression of his system the term 'Danubian Bronze Age' (*Danubische Bronzezeit*). This period he divided into three phases, as is common in the Mediterranean area: early, middle and late (*frühe, mittlere, späte danubische Bronzezeit,* designated by the abbreviations FD, MD and SD). These phases he subdivided further into three smaller segments of time. From his comparative

table (Hänsel, 1968: 21) the synchronisation with other periodisation systems is quite clear.

As the time which has elapsed since the publication of Hänsel's work shows, this system is not much used in the specialist literature. This is brought about both by the fact that the author himself in individual chapters of his work commonly replaces it by others, synchronising it without problem with the western chronological system, and by the fact that many of his chronological conclusions are disputable.

Many periodisation systems are worked out only with regard to bronze objects. Characteristic hoards of bronzes or rich grave groups, which represent a relatively narrow temporal horizon, serve conveniently for this purpose. Such divisions are common in all the neighbouring areas, whether it be Austria (Pittioni, 1954), Bohemia (Böhm, 1937) or Moravia (Podborský, 1970: 16). As I have already mentioned, Mozsolics worked out individual horizons of the bronze hoards of the Carpathian Basin. Novotná (1970) refined this system for Slovakia. For the whole phase Br B (probably taken in the modern conception of the term) she allows, it is true, like Mozsolics, the Koszider horizon, but for the period of the Forró and Ópályi horizons she worked out three horizons with the result that the end of the third is somewhat later than the end of the Ópályi horizon. These three horizons she called Dreveník–Blh, Ožd'any and Buzica–Rimavska Sobota. The horizon following after Buzica–Rimavska Sobota, called Martinček–Bodrog, and still bearing on the matter in hand, ends simultaneously with von Brunn's horizon Kisapati–Lengyeltoti (Brunn, 1968: Pl. 1), that is, the end of Ha A1.

Recently Novotná (1977: 192–3) has tried to work out a horizon of bronze hoards which would follow on from the Koszider horizon and precede the Dreveník–Blh horizon. She suggests that this earlier group of remains should be called Dreveník I after the hoard that turned up in 1928 (Furmánek, 1977: Taf. XXXVII, 13–18). So far, though, she has not given more detailed reasons for such a move. I think personally that the first hoard from Dreveník does not contain such chronologically distinctive objects that we can speak of its temporal priority over the Dreveník II hoard (Neustupný, 1939).

Von Brunn's division was worked out for the late and final Bronze Age in Hungary and Transylvania and touches on our problems only marginally. It would serve no purpose, either, for the period and area we are investigating, to concern ourselves with the synchronisation of the late and final Bronze Age in central Europe and neighbouring areas as for example offered by Sprockhoff (1950), or Vogt before him, or more recently Müller-Karpe (1959), or at the present day Jockenhövel (1974).

The complicated – even obscure – chronological and synchronisational situation is starting to demand a definite regularisation and a new approach to all these questions. In my opinion, the colloquium which took place at the end of 1973 in Frankfurt am Main had a fundamental significance for the simplification of the synchronisation, periodisation and relative chronology. The colloquium, in which some 50 specialists from Europe took part, critically assessed the situation at present in the periodisation of the European and local metal ages, with special regard to the chronology of the south German Bronze Age and the Urnfields. In the following months these problems were further

Years B.C.	Bronze Age Phases	Reinecke Willvonseder Holste Torbrügge Müller-Karpe	Frankfurt School: Central Europe	Frankfurt School: Southern Bavaria	Mozsolics	Bóna	Novotná	Hänsel
	Final	HB 3	Final	Late (Kelheim)				
		HB 2	Late	Middle (Kelheim)	Románd			
		HB 1		Early (Kelheim)	B VI		Somotor	
					Hajdúböszörmény		Lúčky	
		HA 2	Middle (Urnenfelder)	Langengeis-ling			Komjatná	
					Kurd		Martinček	SD II
1200	Late	HA 1	Early (Urnenfelder)	Hart	B V		Bodrog	
			Incipient (Urnenfelder)		Aranyos	Transitional Period	Buzica	
		BD	Final (Urnenfelder)	Reigsee			Rim.Sobota	
					Ópályi			
		BC (BC2)	Late (Hügelgräber)	Asenkofen	B IV	SB 2	Ožďany	SD I
					Forró			
	Middle	BB2 (BC1)	Middle (Hügelgräber)	Göggenhofen		SB 1	Drevenik	MD III
								MD II
		BB 1	Early (Hügelgräber)	Lochham	Kosziderpadlás	MB3	Koszider	MD I
1500					B III			FD III
		BA 2		Langquaid	Hajdúsámson	MB2		FD II
	Early							FD I
		BA 1	Flachhocker	Straubing	B II	MB1		

discussed and again summarised at the special colloquium in June 1974 (Müller-Karpe, 1974: 10).

The result of this attempt was a comparative chronological–regional synchronisation system (Müller-Karpe, 1974: 11, 17), applicable to various regions, and which is to be used in all the volumes of *Prähistorische Bronzefunde.* The basic division of the whole Metal Age in this system is valid both for Europe and for the Near East. In accordance with the principles of analytical archaeology, each of the three basic periods (Copper, Bronze and Iron Ages) has five subphases (incipient, early, middle, late and final). In addition to this general division, a regional division of the Metal Age in southern Bavaria was worked out. In the Bronze Age, which interests us in the present connection, the situation is as follows: the separation of the Straubing and Langquaid phases is the same as Reinecke's original separation of Br A1 and Br A2. The Lochham horizon represents phase Br B1, although one must here keep in mind the new, 'modern' conception of this phase, as has already been made clear at some length. The final groups from Göggenhofen, Asenkofen and Riegsee correspond to phases Br B2 (Br C1), Br C (Br C2) and Br D in the Reinecke–Willvonseder–Holste–Torbrügge system. In a similar way two further phases were separated in the late and final Bronze Age, Ha A and Ha B. For central Europe an analogous division was worked out, named after individual Tumulus phases (*Hügelgräber*) and Urnfield phases (*Urnenfelder*). At the same time the late Tumulus phase squares with the early Urnfield phase.

It would be convenient if the Reinecke–Willvonseder–Holste–Torbrügge chronological system and its labels were used in all specialist works on the Bronze Age in the northern part of the Carpathian Basin, and if equivalent terms were worked out corresponding to the wider temporal concepts of *Hügelgräber* and *Urnenfelder* in the west, which have in the Carpathian Basin a somewhat different temporal and material content than for instance in southern Bavaria. The principal periodisation systems in use are summarised in the comparative table. Of course this schematic representation cannot be considered a totally exact equivalent expression of the relative chronological relations between individual systems. The content of each phase, as each authors understands it, is so variable that it is impossible to show the mutual relationships graphically without omission. One can convince oneself of that by comparing, for example, the numerous comparative synchronisation charts (Hänsel, 1968: Figs. 1–2; Bukowski, 1969: Table 3; Vinski-Gasparini, 1973: Table 7; Čujanová-Jílková, 1974). The table published here is only provided for the purpose of helping specialists to orientate themselves in the problems of the Middle and Late Bronze Age.

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CHRONOLOGICAL SYSTEMS IN THE EUROPEAN BRONZE AGE

by **Anthony F. Harding,** University of Durham

The article by Vaclav Furmánek which precedes this provides an eminently clear account of an exceedingly complicated matter, which is why I have translated it. Most students of prehistory come across the chronology of the central European Bronze Age at some stage in their studies. I would be

prepared to bet that in this country the great majority take one look and never return. Such an attitude is understandable because the matter is quite needlessly complex, and usually based on typological minutiae of the most indigestible kind. Things are not helped by the fact that most of the relevant literature is in German or – as in the present instance – other even less accessible languages. The persistent refusal of English-speakers to come to terms with the German literature leads not only to charges of isolationism by the continentals, but also, regrettably, to fundamental ignorance of the detailed work produced there, and consequently to erroneous typological and chronological conclusions. In the long term, of course, there is no remedy for this situation other than a more persevering approach to the languages in question. For immediate purposes, however, it seems not unreasonable that fundamental articles which serve to clarify a confused situation should appear in English. I hope and believe that Furmánek's present article will serve to orientate the reader in some of the complexities of Bronze Age chronology as it exists today.

The need for such an article to have been written arises out of varied historical circumstances, which Furmánek charts. The system (if one can call it that) has grown up piecemeal and in the hands of many different people. *Quot homines, tot sententiae.* Even the Frankfurt scheme has had little unifying effect on the period as a whole, and in essence does little more than provide new names for old phases. I would therefore like to ask briefly here why such confusion should characterise the Bronze Age in particular, and whether there is not a broader category of 'periodisation' and a firmer basis for chronologies than appear at present.

Most of the divisions between different phases are based on typological change, which may be more or less marked. Usually this change takes little or no account of changes in other aspects of material or spiritual culture, such as religious, economic and social practices. The archaeological record is thus measured in terms of its susceptibility to vary its artefactural repertoire, and it is obvious that this may not provide an accurate reflection of events. Yet the material is there, and is bound to be studied. In some areas, like the Aegean, it can provide a sensitive and detailed indicator of the passing of time; in the rest of Europe it would be idle to pretend that it does that, but it must be true that different assemblages are characteristic of different areas and periods. If their chronological value is limited, we should then ask if these assemblages help in understanding those periods. To this we may answer that they do, but to a very limited extent only. The value of typology in Bronze Age studies can thus be seriously laid open to question, and especially when it leads – as has been described – to such intolerable confusion.

I fear there is no one remedy for this situation. For the present we have to live with the typological past, as redefined and clarified by Furmánek. For the future we must find a more logical and thorough-going system that is more able to cope with new discoveries and refinements.

In *The Bronze Age in Europe* (1979), J. M. Coles and I adopted a two-fold strategy. We deliberately eschewed the detailed typological approach as being neither interesting in itself nor capable of giving clear definition to the period. Instead we suggested a broad division of the Bronze Age into an 'earlier' and a 'later' part – a subjective division, to be sure, but one which we felt made least demands on the material evidence, was logical in itself, and went some way in expressing what we (and most others) saw as a clear difference in character between the period down to the 13th century BC (Br D) and that after it.

Such a division is of course only a means of orientation and is of little help with detailed chronology. It would be possible, though pointless, to subdivide 'earlier' and 'later' (e.g. into I, II, III, etc.). Much preferable is the establishing of an absolute chronology, by radiocarbon dating and other means. I have discussed elsewhere (1980) the application of radiocarbon dating to the European Bronze Age and argued that at any rate for the earlier part its results, when calibrated against the tree-ring curve, are acceptable, though admittedly matters become more difficult by the 13th century BC and thereafter. Down to 1300 BC it is possible to suggest time-spans in absolute years for given cultural groups, some of them quite closely defined. With the processing of more dates for the Bronze Age (especially by Dr Hans Quitta in Berlin, who has produced a long and consistent series, so far unpublished) we may hope for even clearer definition, even if this means abandoning further preconceptions on the way. It is often forgotten just how flimsy the evidence for cross-dating is, and how little can really be stated with certainty. What is even less appreciated is that the supposedly rock-solid foundations of the historical chronology, Egyptian dating, are by no means immovable – as Mellaart has recently demonstrated (*Antiquity*, **53**, 1979: 6–18) though only for the Old Kingdom.

It is still too early to specify closely the chronological limits of each group because of the small number of determinations available. If Central European scholars had devoted the zeal they spend on 'periodisation' to the obtaining of radiocarbon samples, we might now be in a better position to assign centuries to cultures. This will come in due course. In the meantime, I suggest we suspend judgement and start finding those samples. The absolute dates will replace the rickety framework of relative chronology that has been so painstakingly built up and is here clearly described by Furmánek.

Abstract

The complexity of chronological schemes for the European Bronze Age is such that basic articles which clarify the situation, such as Furmánek's, merit publication in translation. The value of typological study if discussed, and a division of the Bronze Age by absolute age, based on both traditional and radiocarbon chronology, is advocated. An appeal is made for the collection and publication of more radiocarbon dates for ill-served areas and periods.

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Summaries of M.A. and M.Sc. Reports for 1978/79*

Minoan Larnakes from the Armenoi Cemetery (Report housed in the Institute of Classical Studies Library)

The dissertation discusses 13 larnakes (clay coffins) from Armenoi, western Crete. One hundred and twenty chamber tombs with multiple inhumations have so far been excavated in a cemetery which dates to the LMIIIA/B periods (the 14th and 13th centuries BC). Associated grave goods and human remains are as yet unpublished, so the significance of burial in a larnax is unclear.

The larnakes are of the chest type, known elsewhere in Crete and in mainland Greece, notably Tanagra. In style and content, the painted decoration resembles that of contemporary Cretan larnakes and pottery-stylised derivations of earlier Minoan abstract and naturalistic motifs, together with animal, bird and human figures of a type rare in Late Minoan art – and quite different from that known from Tanagra. The Tanagra iconography mainly depicts mourning scenes, while the Cretan examples are more obscure.

In the Armenoi case cult symbols and a 'goddess with upraised arms' may have a religious significance. Bull processions with cult objects could have been connected with funerary ritual. However, it is less clear that hunting scenes have a religious meaning, but later iconographic and literary evidence offers some support for such an interpretation.

Finally aquatic imagery, stags and wild goats do not reflect overt symbolism.

Katerina Baxevani

The Administration and Organisation of Mining During the Early Roman Empire with Special Reference to Southern Spain

The study examines the evidence for the Imperial administrative structure and the internal organisation of local mining districts in Southern Spain. It looks at the district of Rio Tinto in detail as the scale of exploitation shown by both the mining technology and the amount of slag produced have been used to suggest direct state exploitation here in contrast to other mining districts. It argues that the procuratorial system embraced large regions overseeing local mining districts administered from city centres. It discusses the land ownership implications, particularly the question of mineral rights and the role of the Fiscus. A model of the typical local mining district of the Mid-Principate is proposed following the examination of evidence of both earlier and contemporary evidence including that from Laurion, the Late Republic and Alpistrel. These sources are combined with the archaeological evidence from the Rio Tinto area to reconstruct a mining district combining Imperial and private features to permit the maximising of state profits without excluding the typical small scale commercial enterprise of the ancient world. It is argued that there is no case for large-scale use of slavery in mining in Southern Spain during this period.

J. Bromwich

Paleoekistics: An Alternate Approach to the Integration of Spatial Archaeology and Settlement Studies

Since the emergence of settlement pattern studies in the United States in the late 1950s, 'settlement archaeology' has evolved through several phases of various methodological and theoretical orientations, culminating in the application of rigorously quantitative techniques of spatial analysis and the formulation of spatial archaeology. Despite these recent advances, however, a unified and systematic approach to the investigation of prehistoric settlements is still lacking, and despite a continuing reliance on geography and ecology for analytical models and empirical generalisations, archaeologists have so far ignored the potential value of ekistics, the science of human settlement.

*Except where otherwise stated, *Reports* are housed in the Institute of Archaeology Library.

Conversely, spatial archaeology is eminently suited to play an important role in the ekistic study of settlement evolution. Paleoekistics represents an integration of archaeological and ekistic methods and theory whose aim is to investigate all aspects relating to prehistoric settlements on four levels of resolution, i.e. micro, semi-micro, semi-macro, and macro. Emphasis is placed on the analysis of spatial interrelations among the five basic elements of human settlement, Man, Nature, Society, Shells, and Networks, and between this and other socio-cultural subsystems. Besides the conceptualisation of normative trends in the structure and texture of settlements, such as illustrated by the Organic Model, paleoekistics also stresses the study of the spatial structure of society and the spatial dimension of social organisation.

S. Held

Change and Continuity in Lithic Assemblages in S. Sulawesi, Indonesia

This paper is about changes within lithic assemblages, particularly in South-east Asia between 6000 BC and 4000 BC. Some components of the assemblages from Ulu Leang and Leang Burung 2 in South Sulawesi, Indonesia, are examined in detail and compared to contemporary assemblages in North Sulawesi. Microlithic stone tools from the former site, and cores and used flakes from both sites, are analysed metrically in order to determine the extent to which the basic dimensions (length and width, and shape) of flakes has changed over the period of occupation. Microliths are characterised also by reference to typological categories.

The analysis shows that changes in stone tool assemblages in South Sulawesi were of a qualitative nature. The size of flakes removed from cores changed only marginally, and that slowly, during the period of occupation of the two sites – 32,000 BP to about 3,000 BP. Even the most significant change in composition of stone tool types – the addition of microlithic forms at Ulu Leang – involved no appreciable change in the size of flakes or the flaking technique. Backed implements were made on small flakes and there was no blade tradition. This is in direct contrast to contemporary sites in North Sulawesi, where blade production begins during the period 6000–4000 BC. Changes in lithic assemblages in both areas are viewed in the wider context of South-east Asian prehistory.

Gary Presland

The Small Cuboid Incense-burners of the Near East in the First Millennium BC

During this century much has been written concerning the significance of the cuboid incense-burner. From a review of this literature several points become apparent:

1. The use of a certain class of objects as incense-burners is well documented.
2. These particular examples can be segregated from similarly decorated objects (e.g. Cypriote pyxides) previously cited as incense-burners.
3. The cuboid incense-burner appears to be solely a Western Asiatic artefact dated within the first millennium BC, and possibly extending into the first two centuries AD.
4. While most typologies have concentrated on the object's decorative features, a type-series based on the differing forms of cuboid seems appropriate.

A generous sample of the burners is presented by site and area. Following a discussion of this catalogue, several conclusions are proposed:

1. The cuboid incense-burner is apparently an exclusively south-western Asiatic phenomenon, popular between the late 7th (or early 6th) to 1st centuries BC.
2. The symmetrical square form appears to have been the original idea, and to have degenerated into the tall and squat shapes as time passed.
3. Three main regional groups can be distinguished (based on method of manufacture and decoration): a southern Mesopotamian, a south-west Arabian and a southern Levantine; the first and third are linked geographically to the second by subgroups.
4. Because the vast majority of these objects are reported from domestic (or burial) contexts, any religious or cultic significance remains to be demonstrated.

M. O'D. Shea

Comments on the Transition between 'Khabur Ware' and 'Nuzi Ware'

Khabur Ware and Nuzi Ware are the two principal types of painted pottery in northern Mesopotamia during the second millennium BC. Their appearance and distribution has been correlated with the arrival and movement of ethnic groups who, in the case of Khabur Ware, came from Iran or Syria and, in the case of Nuzi Ware, are identified as Hurrians and came from the north-east or north-west.

Khabur Ware can be linked to north Mesopotamian ceramic traditions by its similar shapes, wares, and geometric designs. It merely represents the last stage in a transition from earlier incised and relief designs to painted designs. Nuzi Ware incorporates elements from several ceramic traditions. The shapes originate in the third millennium repertoire of southern Mesopotamia, the painted decoration *per se* is a north Mesopotamian feature, and the designs reflect both Mesopotamian and foreign influences.

Neither ware is an ethnic product. The initiative for the transition to painted designs of Khabur Ware may be derived from the wealth acquired by the Assyrians as middlemen in the Cappadocian trade. The eclectic composition of Nuzi Ware results from the formation of the Mitannian Confederacy which thrived as the intermediary between Babylonia and the Levant.

Diana L. Stein

Summaries of Undergraduate Reports for 1978/79

Mineral Pseudomorphs – A Study in Burial Environments

This essay is an attempt at finding the mechanism(s) responsible for the mineralisation of organic materials by inorganic substances – in particular metal corrosion products. The main part of the essay deals with soil as an environment for the decay of organic materials and the corrosion of metals including microbial corrosion of metals and a discussion of the toxicity of metal salts to micro-organisms. Soil silhouettes are briefly dealt with in the introduction. The final part of the essay deals with methods of conserving, handling and examining the organic remains preserved on metal objects.

P. M. Barford

Roman Vehicles

The aim of this work was to survey the evidence available for Roman wheeled transport. Our knowledge of the types of vehicle used under the Roman empire rests largely on pictorial representations and references by the classical authors. From these sources it has been possible to draw a distinction between the cruder rural vehicles, often fitted with solid wheels, and those intended for road use. The latter were equipped with spoked wheels, several examples of which have survived. The form and function of iron tyres, hub bands and linings fitted to spoked wheels are discussed separately.

From reliefs and the remains of waggons buried in Thrace, a case has been made for the use of the turning fore-carriage in Roman times. Vehicles buried in Thrace, Pannonia and elsewhere also show that two- and four-wheeled passenger vehicles could have a form of strap suspension, the body being hung from bronze mounts on top of pillars rising from the axle ends.

Normally, little of a vehicle under-carriage has survived, but iron axle guards and the linch pins which passed through them are described and so are the more elaborate bronze axle caps.

As the inefficiency of the ancient neck-band harness had a pronounced effect on vehicle size and the development of road transport, harness and the arrangement of draught teams has been given some consideration.

Ian Bell

A Study of 13th Century Rouen Type Pottery and its Influence on the Contemporary British Ceramic Industry

A typological framework on the basis of form and decorative motifs was proposed for the largest known collection of Rouen Type jugs, those in La Musee des Antiquities, Rouen. The finds of Rouen Type jugs imported into the British Isles were then fitted into this framework, with some adaptations; and conclusions about dating and distribution of the ware were drawn, giving further information on the trade in wine between Normandy and the British Isles. In the final chapter six groups of British jugs, manufactured in the Rouen Type style were examined, their similarities with the true Rouen Type jugs were noted, some attempt was made to locate their centres of origin, and their distributions were compared with that of their prototypes, in order to assess the influence exerted by the styles of the French wine jugs on the British pottery manufacturing industry.

Michelle Bonnel

The Gold Finds From Selsey Bill, Sussex

The finds of late Iron Age coins and other gold fragments on the shore at Selsey Bill, Sussex, have often been taken as indicating the former existence of an oppidum with its own mint at this site,

the other remains having been removed by sea erosion. The basis of this study is a catalogue of all the gold finds other than the coins, aimed at determining their date and nature. The material was found to have a wide date range and includes a number of Mediterranean products.

A discussion of the findspots is made using evidence suggested by the writings of local collectors in the late 19th century and early 20th century and the recorded coin findspots. The question of whether the finds represent a small number of hoards deposited in the brickearth of the peninsula is considered.

Finally the most probable of a number of possibilities concerning the composition and date of deposition of the hoard(s) is suggested as well as its relevance to the question of a Selsey oppidum.

J. Sarah Brown

Krefeld Gellep: A Study of the 3rd–8th Century Cemetery at Gellep II, with Special Reference to the Late-Roman Section

In this paper a study of the Late Roman/Frankish cemetery at Krefeld-Gellep, on the west bank of the Rhine, was undertaken. This study was based almost entirely on the work of Renate Pirling who has been working on the site since 1959. The results of her work have been published in four volumes, two in 1963 (*Das Romisch-Frankische Graberfeld von Krefeld-Gellep*; serie B, Band 8, Berlin), and two in 1966 (as above, but serie B, Band 2). In this report no criticism is offered of Pirling's work but rather her information was studied in the light of six elements of funerary rite defined by Dr G. Clarke in his work on the Late Roman cemetery at Lankhills, Winchester. Each of the six elements: method of disposal; conveyance to disposal; position of the body at disposal; nature of any pit or chamber; presence and character of grave furniture and organisation of the cemetery, are taken and applied to Gellep II. Obviously not all of the sections can be treated in very great detail as the information is not readily available. The paper concentrates, for the most part, on the Late Roman aspects of the cemetery; however, some attempt is made to try to trace the changeover from Roman to Frankish influence using the evidence provided by the graves of Gellep II. The information available in this respect is quite large and from it it can be seen that there was a fairly gradual transition from Roman to Frankish rule.

Richard Courteney-Harris

Agriculture in the Life of Towns in Roman Britain, with Special Reference to Silchester, Cirencester and Caerwent

The aim of this paper is to examine the agricultural life of Romano-British towns and their surroundings and to assess the contribution by the towns themselves, if any. Particular emphasis was laid on the farms within the town walls. Silchester, Cirencester and Caerwent were chosen as the basis for study since, in the case of Silchester and Caerwent the plans are known in some detail from the extensive excavations carried out by the Society of Antiquaries at the turn of the century, and in the case of Cirencester due to recent surveys by CRAAGS and RCHM, the settlement of the surrounding area is better understood than anywhere else in Roman Britain. The three towns, although all civitas capitals, are very different in size and nature. Therefore any conclusion which applies to all three can legitimately be expected to apply to most civitas capitals in Britain.

The report concludes that all three towns thrived on the efficient agricultural exploitation of the surrounding area and that the immediate environs of the towns were often, although not always, farmed within the towns themselves.

S. Drought

A Report on the Conservation of Bark Cloth

Bark cloth is a non-woven felted material made from the inner bark of certain plants. In tropical climates it was manufactured mainly for clothing, and reached its highest level of development in Polynesia. The technology from this area is well documented and material from Polynesia was mainly selected for study.

As little has been written on the conservation of bark cloth, questionnaires were sent to 20 ethnographic museums which were thought to have bark cloth in their collections, to ascertain general conditions and treatments.

The report consists of two sections, technology and conservation, with emphasis on the latter. Because bark cloth shares similar properties with textiles and paper, I have used their respective conservation techniques to develop methods applicable to bark cloth. The areas of investigation and experimentation were the following: deacidification, cleaning, crease removal, repair and storage. Some of my techniques are illustrated by accompanying photographs, taken at the Horniman Museum and its storage facilities.

Natalie E. Firnhaber

A Study of the Effect of Charring on Rice Grain

Experimental work with identified varieties of rice, *Oryza sativa* spp., was conducted to see how charring effected the metrical properties of the grain. If the grain is not distorted visually by charring, then each dimension will decrease slightly. If a critical threshold of temperature, or rate of heating, is approached the width will increase slightly. However, in neither case does this alter in practical terms the breadth/width, of length/breadth × width indices of each variety. If the grain splits or oozes then any calculated indices are not meaningful.

The effects of three variables were tested when charring the grain. Final temperature, rate of heating and initial moisture content were found to be important limiting factors when trying to produce undistorted grain.

The reasons for the reduction in grain size, or its splitting are examined, and also the different reactions of the grain varieties to the same heating regime. The role of water vapour in causing the splitting of the grain is examined.

The grain is not carbonised, it is charred. It is not reduced to elemental carbon, but to substances related to starch that cannot be metabolised by microfauna and flora.

Daryl Garton

Early Saxon Structured Graves in England with a Consideration of Structured Graves in Europe from 5th to 12th Centuries

The forms, distribution and chronology were examined in various parts of Western Europe using published archaeological and historical information.

For England, an existing typology was amended and two areas were defined for separate examination.

The structures in Kent were looked at in some detail, whilst those in the rest of England were dealt with more briefly. In both areas a combination of published and unpublished archaeological information was used.

It was shown that in Kent the structures functioned as coffins but that there was no obvious connection between the structures and the status of the individuals being buried in them.

It could be seen that the Kentish group of structures was very similar in form and date to a 'Lombard/Avar' group in Central Europe, though direct links between the two groups were thought unlikely.

G. E. D. Grainger

Roman Military Gateways in Britain

The plans of military timber gateways excavated in Britain were studied. These revealed that with very few exceptions there appears to be nine distinct types of gateway. The division of types was based on the number of parts in the structure, the number of portals and the position of any guard-rooms or towers. The importance of the gateway in fort planning, and the way in which this affected its design was discussed. An attempt was made to suggest possible reconstructions for the gates from the evidence in the ground.

The smallest single portal gates without towers seem to have been used for minor entrances in fortlets and as postern gates. These were used throughout the whole period of military timber building. The large double portal gateways with flanking towers were only built in the period immediately after the invasion, probably by legionaries.

J. Hall

SUMMARIES OF UNDERGRADUATE REPORTS FOR 1978/79

Romano-British Stone Coffins in England

The use of stone coffins for inhumation during the Romano-British period was widespread in 'lowland' Britain with the majority centred around walled urban centres and the rest individual finds. The shape and dimension of coffins are discussed as are the stones used, working techniques, orientation, skeletal contents, mineral contents and dating. A gazetteer of finds is also included. The conclusions drawn from the material are an unusual distribution of coffins with no coffins in the Midlands, north-western England or on Hadrian's Wall. The majority of the remaining coffins occur at major wealth centres. Few coffins are earlier than the late 2nd century AD if any. There are more female than male inhumations and orientation is not predominantly 'Christian'.

Alexandra G. Harrison

An Examination of Seasonality and Settlement Patterns with Reference to the Magdalenian of South-west France

A number of criteria were proposed which could be used generally to show seasonality. Of these, faunal evidence proved to be the most abundant and reliable seasonal indicator. This comprised mainly reindeer antlers, and the season of occupation was determined on the basis of the annual growth cycle observed among modern reindeer. Evidence from reindeer teeth was not considered to be a reliable indicator. The faunal data provided firm evidence only for winter/spring occupation of sites in the Pyrenees and Perigord. The nature of settlement throughout the year was therefore necessarily hypothetical. As an aid to reconstruction, a wide use was made of evidence relating to the seasonal movements of ethnographic groups exploiting similar resources.

The applicability of Sturdy's three main subsistence strategies was considered; migration-hunting, herd-following, and single-season exploitation. There is no definite evidence for migration-hunting. Herd-following could have been practised providing the reindeer migrations were short-range. Single-season exploitation of reindeer was also plausible, since abundant alternative resources (e.g. coastal and riverine, notably salmon) were probably available when the reindeer were absent.

It was concluded that the application of more refined techniques, wider publication of relevant data, and further surveys for sites in likely areas (e.g. high-altitude summer pastures), would all contribute to furthering our knowledge of seasonal settlement in south-west France.

Patricia Hayne

Form and Function in the Roman Theatre

The Roman theatre was one of the three main sources of entertainment for the Roman public, the other two being the Circus and the amphitheatre. The objectives of this dissertation have been two-fold – firstly, to trace the development of the form of the Roman theatre, that is its shape or visible aspect, and secondly, to investigate the functional variations that existed.

A great many theatres survive throughout the Roman world and by focusing attention on a number of these and combining their study with that of contemporary literature, mural paintings, vases, inscriptions and teracottas, it is possible to piece together the innovations and developments that took place within theatre construction. In chronological terms this represents approximately 800 years, from the early Italian popular comedy and tragedy to about AD 400 when many theatres had fallen into decline and disuse.

This dissertation is divided into three main parts, the first one dealing with the initial development of the theatre building, the second with the theatre in its evolved form and the third with the Graeco-Roman theatre and functional variations that occurred within some theatres. Whilst detailed analysis of individual theatres was not possible within the limited space available, a good idea of the form and function may be gained from a general study.

P. J. Heykoop

History and Technology of Lustre Ware

Lustre decoration was first applied to pottery in the Near East during the 9th century, and is definitely an Islamic invention. Although archaeological evidence has not been completed, scholars now tend to accept Mesopotamia as its country of origin. From there it spread to Egypt, where it was made until the end of the 12th century. Syria and Persia produced lustre pottery between the 12th and the 14th centuries. The technique reached Spain in the 13th century, from where it spread

to Italy and later France in the 16th century. Due to its complicated technology the art was periodically lost, having only been revived in Europe in the middle of the 19th century.

The only way of manufacturing lustre decoration successfully involves the application of the pigment to a body furnished with a low melting point glaze. The pigment consists of ground down silver and/or copper salts suspended in a medium of vinegar. Further diluting is achieved by the addition of an inert material such as china clay. The pottery is fired under reducing conditions between 650 and 750°C. The metal particles adhere to the softened glaze resulting in a metallic and irridescent appearence.

Thin sectioning and X-ray spectrometry are reliable means of identification of lustre ware, if stylistic categorisation proves impossible.

Gwen Hoffmann Sonderborg

A Preliminary Survey of Romano-Celtic Temples (Excluding Britain)

This survey outlines the evidence available for Romano-Celtic temples on the continent and provides a summary of some of the general trends in architecture, the temenos and associated structures, finds, dedication, and chronology. The study is designed as a basis for further research and to this purpose there is a gazetteer of some 200 sites, including 240 Romano-Celtic temples. Also included in the gazetteer are a number of sites, which, although not having temples of the standard concentric plan, are clearly of closely related type.

P. D. Horne

The Shields of the Roman Army – From Augustus to the 5th Century

The paper deals with most aspects of evidence pertaining to the shields used as field equipment by the Roman Army, beginning with the situation existing under Augustus, and ending with the evidence of the *Notitia Dignitatum* as the last major source of information before the collapse of the Western Empire.

It commences with a survey of what may be gleaned from historical and monumental sources about the form of shields and how this changed, and their precise methods of employment, during the last century BC, and the first five centuries AD.

There follows a consideration of the extensive archaeological record, firstly, with regard to the types, distribution and circumstances of discovery of the most common and distinctive remains, *umbones,* or shield-bosses. Secondly, the more diverse evidence for the shield as a whole is analysed, to produce a detailed picture of the construction of these arms, again supported by literary and monumental evidence.

A final chapter considers the evidence for shield decoration, and the question of unit-specific badges. Attention is concentrated on Trajan's Column and the *Notitia,* while other monumental, literary and archaeological evidence is used to trace the development of such devices, and suggest possible origins.

A catalogue of the archaeological material is appended.

Simon James

Some Initial Steps in the Technological Analysis and Conservation of an Egyptian Mummy-case of the 22nd–26th Dynasties

In this report an attempt is made to establish the date and provenance of the mummy-case as closely as possible from its general style and inscriptions and to see if these factors could have had any bearing on the manner in which it has been constructed.

Although the local environment of the deceased could and probably did supply the type of wood required for the 'dug-out canoe' method adopted, the author was unable to find a sufficient number of comparable examples to justify drawing any firm conclusion, beyond noting the rarity of coffins of this type.

The state of preservation of the mummy-case is then described in detail together with the first steps taken in its conservation. Possible further treatments are indicated.

Victoria M. T. Kelly

SUMMARIES OF UNDERGRADUATE REPORTS FOR 1978/79

The Dux Arabiae in the Notitia Dignitatum

This paper gives a reappraisal of the evidence for the locations of sites named in the Notitia for late Roman Arabia. It especially emphasises the lack of archaeological work in Roman Arabia and foresees the enormous scope for future excavation of sites.

A discussion of the early Roman occupation of the province is followed by a chapter presenting the archaeological evidence from possible Notitia sites. In the third chapter, the literary and epigraphic evidence of the Notitia sites is brought together for the first time, and several attempts by others to locate the sites on insufficient evidence are seriously questioned. The Dux Arabiae is also looked at with regard to the military organisation of the late Roman province and the proposal of a 'lines' zone rather than strictly demarcated frontier is supported. An examination of the existing plans and locations of the sites is supplemented by the illustrations.

While the report does not propose any new positive identifications, it points out the limits of the evidence available and the need for much more work out in the field.

Alistair C. Killick

Conspiratio Barbarica: Barbarian Incursions into Late Roman Britain (340–370) and the Imperial Response, as Described by Ammianus Marcellinus and Attested by Recent Archaeological Research

This report is based on the premise that only through a joint effort between historians and archaeologists can any significant advance in our knowledge of the Roman period be made. It sets out to provide a clear, unbiased summary of the available evidence, both textual and excavational, for the period in question followed by a brief résumé of currently held opinions on several of the important issues raised.

The section on historical sources begins with the best available – Ammianus Marcellinus and then delves into other textual material ranging from the poems of Claudian to the Notitia Dignitatum. The survey concludes with a look at the epigraphic evidence.

The archaeological data is arranged by type of site, commencing with Hadrian's Wall and passing on through three other lines of defence to 'Towns' and 'Countryside'. Finally, three important sets of finds – coin-hoards, belt-fittings and silver ingots – are put into perspective.

Among the conclusions made in the second part of the work are that bastions were added to town walls at several different dates in the 4th century as the needs of defence and central administration dictated and that the Theodosian reorganisation of Britain, although of undoubted importance, has been inflated beyond all recognition by an over-willingness to ascribe all 4th century changes to this one sadly overworked date.

Peter D. Leather

A Proposed New Method for the Stabilisation of Archaeological Iron

The present methods of stabilising archaeological iron by washing to remove soluble iron chlorides or heating at high temperatures to volatilise iron chlorides, both have serious disadvantages. The feasibility of combining washing and low temperature heating to improve the stability of iron was investigated. A study of corrosion showed that unstable iron contained β-FeOOH. If β-FeOOH is heated it dehydrates, releasing chloride ions, and forms α-Fe_2O_3 (haematite). The released chloride ions react to give soluble iron chlorides which can then be removed by washing.

Thermogravimetric analysis and X-ray diffraction of samples of iron corrosion heated at different temperatures suggested that the dehydration temperature of β-FeOOH was 280°C. The possible microstructural damage which could be caused by heating iron artefacts at temperatures up to 350°C was researched. It was found to be minimal compared with the high temperatures used for hydrogen reduction. However, the destruction of martensitic areas is a possibility.

Washing was carried out using a Soxhlet extractor, in which the air was replaced with oxygen-free nitrogen to prevent fresh corrosion forming on the iron. This arrangement proved to be very successful. Heating experiments showed that considerable amounts of soluble iron chlorides were formed in Roman nails during heating. Heating at 300°C for 2–15 hours, as expected, produced soluble chlorides. Heating at 225°C was also effective, suggesting a two-stage breakdown of β-FeOOH. Tests at high relative humidity, of two months duration, indicated that the introduction of heating at 300°C between two washing stages, gave iron of much greater stability than washing alone.

Karen L. Mercer

Examination and Conservation of Archaeological Textiles

This paper deals primarily with examples of conservation in a particular group of textiles. Sections 2 and 3 describe the examination and conservation of excavated textiles from Ghubeyra in Iran. Section 1 outlines the background information that is required for an understanding of archaeological textiles for conservation.

The role of the conservator of archaeological textiles is to observe, record and treat the textiles in order to provide information that may be lost in the course of treatment. It is also necessary to provide support and protection for fragile textiles should they be needed for further examination or display.

Detailed knowledge of all aspects of textile technology is not necessary for the conservation of archaeological textiles but an understanding of methods of fabrication, origins of dyes and fibres, and techniques of analysis is invaluable in the recording and treatment of textiles.

M. S. Noonan

Prehistoric Shell Trade in Ecuador and Peru

Two marine shells, *Spondylus* and *Strombus,* are common in archaeological contexts in prehistoric Ecuador and Peru. Both are warm-water species and occur along the Pacific coast of South America, north of the Gulf of Guayaquil. It is suggested that they were traded to Peru.

The result of this survey is 96 find sites; the time span from *c.* 2500 BC to the Spanish Conquest in AD 1532. Up to 1500 BC *Spondylus* and *Strombus* shells occur mainly in the source area; inferential evidence in form of *Spondylus* imitations, however, suggests contacts to the North Highlands of Peru. Between 1500 and 500 BC shell distribution reaches the Central Coast of Peru, between 500 BC and 500 AD the South Coast, and between 500 and 1000 AD the South Highlands of Peru and north-easternmost Highlands of Ecuador. The two late periods from 1000 to 1532 AD show a consolidation of the trade pattern.

The result of this survey suggests:

(a) A change in value of *Spondylus* and *Strombus* shells: from an emphasis on ornamental value up to *c.* 500 AD to one of symbolic/prestige value.

(b) A change in possible trade routes from:
a land route along the major river systems through the north-east Highlands to the north Highlands,
to a land route along the Pacific coast to the north coast of Peru,
to a possible sea route from the source directly to the north and south coasts of Peru.

Hella Oliver

The Origin of Black-on-Red Ware in Cyprus

This paper is an attempt to justify the theory of a Phoenician origin for the Black-on-Red ware in Cyprus, which appears sporadically in Early Iron Age contexts and is found in large numbers in the later Iron Age. This pottery has not as yet been systematically studied.

Black-on-Red was also found on the Western Asiatic mainland.

The classification, used in Chapter One, is that devised by Professor E. Gjerstad (Swedish Cyprus Expedition Vol. IV.2). Following the classification is geographical distribution of this ware both in Cyprus and the Asiatic mainland. Black-on-Red ware appears in Palestine at about the same time as in Cyprus, or perhaps a little earlier and as foreign ware. The distribution seems to indicate that this ware was characteristic of the southern Phoenician coast, the Lebanon, whence it spread to Cyprus and the surrounding Syrian kingdoms, as a result of Phoenician trade in unguents. Indeed the earliest and finest vessels are miniatures and are found in greater numbers on coastal sites, particularly Amathus, on the south coast of Cyprus.

The later, wider distribution seems to coincide with the Phoenician colourisation of Kition. By this time, Black-on-Red was produced locally.

Further support for the theory of a Phoenician origin is provided by the appearance of this ware in the Dodecanese and Crete, where it also indicates trade in unguents.

Despina Panayiotou

The Wells School of Sculpture

The majority of the pieces executed by the Wells School are to be found on the West Front of Wells Cathedral, the masterpiece of Bishop Joselyn and his mason Thomas Norreys. The inspiration for this façade is to be found in the Romanesque cathedral fronts of Poitou and Spain, rather than in the contemporary French Gothic examples of the Ile-de-France.

While the French influence can be seen in the Wells sculptures themselves, the main source of inspiration seems to be in the Late Romanesque works such as the Worcester Majesty and the carvings of the North door of the Lady Chapel at Glastonbury. While the Byzantine influence is obvious in these works, it is gradually being abandoned for a more plastic sculpture.

A strong classical influence can also be detected in the Wells sculptures, in the execution of the round faces, in the fine profiles, the fall of the robes caught up by narrow belts and more definitely in many of the kings with their raised feet and 'arms akimbo', an assertive attitude very popular in classical art.

Apart from the sculptures seen at Wells, the school produced a number of other pieces, notably the Longsword effigy at Salisbury, two knight effigies at Shepton Mallet, possibly the FitzNicholas effigy at Twickenham, and most certainly the Bristol Madonna and Child.

There is a strong Wells influence to be found in some other Bristol effigies. However, this must not lead one into thinking that with the completion of the Wells façade the school moved wholesale to Bristol. This influence can also be seen in Shrewsbury, Abbey Dore and Dorset and as far away as Sussex and London. While discounting this theory, I cannot agree with the suggestion that the Wells style was a chronological rather than a local development.

There certainly was a school of sculpture with its headquarters at Wells, and while its production was limited, it is quite distinct.

S. W. Reid

The Cities of Asia Minor from 350 to 700 AD – A Survey

This survey is an attempt to gauge the extent of archaeological knowledge of the urban sites in this period. There are 54 sites included, some of only meagre value and some, such as Aphrodisias, of surpassing quality for the archaeological detail which they provide. Although only a relatively superficial study, certain conclusions were drawn from this report. These concerned trends towards urban survival, even into the late Byzantine period, as the survey moved from east to west, and the relevance of splitting the country into its geographical areas rather than using the administrative units of the Roman or Byzantine eras. On the matter of urban decline in the 6th and 7th centuries AD, there is insufficient evidence in the west for a reasonable conclusion either way, but on the whole, it would seem that the question should certainly still be open to doubt.

A. E. J. Richardson

The Technology of the Copper Alloy Artefacts from Ban Don Ta Phet, Thailand

Ban Don Ta Phet is a village which is situated in the district of Phanom Thuan, Kanchanaburi Province, in south-west Thailand. The copper alloy artefacts excavated from this site are very interesting; these are containers such as bowls and personal ornaments (i.e. bracelets, anklets and rings). The site is dated to the Iron Age of Thailand. There are two main types of containers, thick-walled and thin-walled ones. The thin-walled containers are very thin, varying in thickness between 0.2 and 2 mm at the rim.

An X-ray fluorescence spectrometer was used for qualitative analysis and quantitative analysis. The results of the analyses of the composition of the alloys showed that the majority of the copper alloy containers had tin in the range of 20–30%. Within this range, the representative percentage of tin was 23–25%. For bracelets, the tin was lower than for the containers, and a considerable amount of lead was found.

The high tin alloy, which is very difficult to work, was chosen to be used in the manufacture of the containers. It is suggested that this particular alloy had been chosen in order to imitate gold.

From the data obtained from the analysis and metallography, the manufacture of containers and lids may be described as follows: firstly, the object was cast into its rough shape, then hot-worked to the required form. The object was then annealed at a predetermined temperature (586–798°C) and quenched rapidly.

The majority of personal ornaments were cast. Heat-treatment such as annealing and quenching after casting was found to be used in a small number of samples.

Most aspects of the technology of the containers were investigated. Personal ornaments such as rings and bracelets were also investigated, not on a large scale, but to compare them with the containers.

Various aspects of the technology of the copper alloy material have been investigated, however further fundamental metallurgical work will be required before all the observed structures are fully understood.

W. Rajpitak

Anatomical Wax Models

Anatomical wax models were produced for didactic purposes and to illustrate with scientific exactness the current knowledge of human anatomy. Their creation required the skills of a sculptor, well versed in the large-scale casting and modelling of wax, and the skills of an anatomist, who chose and prepared the dissections of the cadavers from which the models were copied. Collaboration with the anatomist at each stage of modelling and reference to standard anatomical illustrations ensured absolutely accurate representation.

This thesis concerns itself with the historical background, techniques of construction, causes of deterioration and conservation of the models. The large collection of models at the Zoological Museum of 'La Specola' in Florence and the models by Joseph Towne at the Gordon Museum in Guy's Hospital, London, are dealt with in particular. A section has been included on the large number of dermatological models by Joseph Towne, although these are not strictly anatomical.

Pamela A. Thomasson

Ottoman Turkish Artillery Fortification, 1480–1720

After investigation of approximately 100 Ottoman forts, the following conclusions could be reached. First, 'artillery fortification' was introduced into the Balkan provinces *c.* 1480, whilst apparently no significant use was made of it in the east until after 1750.

Second, three types of artillery fort are to be found in the west. The first, the Bastion System, present at only seven sites, was introduced in 1573, but was not widely adopted until after 1680. At all sites variations of the 'Compound System' seem to be the norm, with only limited use of outworks, although broad covered ways adopting a tenaille trace seem to have been common. The second type, using guntowers and batteries, was limited to mountainous areas (e.g. Bosnia), coastal forts (e.g. Dardanelles) and to early experiments in Bosnia *c.* 1480. Half of the artillery forts fell into the third category, forts employing 'bastiyas' (rondelles), and therefore the Ottoman idea of artillery fortification appears to have been fundamentally 'active', employing bastiyas at strategic points to give a fan-shaped spread of fire, with little attention paid to curtains. Thus, in the Ottoman Empire, as in the rest of eastern Europe, the 'transitional period' continues into the 17th century (e.g. Fehevvár Bastyá, Budapest, 1661), possibly culminating in a 'late' development of the style in the bastion-like structures at Khotin, Chalkis and Szigetvár.

N. D. Williams

Book Reviews

TODD, M. (*ed.*). *Studies in the Romano-British villa.* Leicester, Leicester University Press, 1978, 244 pp., 66 figs. £7.25.

In the preface to Rivet's 1969 compendium on the Romano-British villa, Sir Ian Richmond opened the papers with the quote 'Roman villas are so well established in Romano-British archaeology as to require paradoxically some explanation'. This it did provide, and with Todd's comment on p. 9, it is perhaps valid to see this compendium as a complement to the 1969 book, and a barometer measuring the growth of our understanding since then.

First, however, the contents. There are 11 chapters dealing with emergence of 1st century villas in N. Essex (Rodwell), regional studies of villas in the Verulamium, Nene Valley and Hampshire areas (Neal, Wild and Johnston), a detailed appraisal of Winterton (Goodburn), the study of a villa estate at Godmanchester (Green), regional aspects of winged corridors, and aisled buildings, in Britain (D. J. Smith and Hadman), villas as a key to social structure (J. T. Smith), villas and society (Todd), and a study of the Roman and Saxon settlement at Orton Hall Farm (Mackreth).

No central theme is apparent and consequently a reviewer finds it difficult to do equal justice to all of the papers. On the other hand, several threads of common concern can be seen in all the papers. Firstly, continuity of the native element (the groundwork to which was so well treated in 1969 by Bowen) comparatively late into the Roman period. In Rodwell's paper there is an attempt to differentiate between native and Roman villas on the basis of patera and ewer burials, and a reappraisal of roller stamped flue tiles respectively (1st century AD). Socially, Todd sees the transformation of the rigid old Celtic hierarchical system (according to Caesar's account) of Kings, *Equites, Plebs* and other levels into an initially more fluid system of *Decuriones, Coloni* and *Servi.* In terms of physical continuity of occupation, Neal and Green give clear examples of what is detectable in purely archaeological terms, although continuity in this, or any period, is still a term requiring a lot more qualification.

Secondly, at the other end of the scale, there is the survival and transformation of villa estates, and occasionally villa buildings, in the Late Roman and Early Saxon period. In 1969, Rivet could only point towards finer work and clearer understanding, something that from these results we seem to be closer towards. Green traces the physical survival of the villa *estate* into the Saxon period while Mackreth, in a masterly article, investigates the possibility of coexistence of Romano-Britons and Saxons (?Foederati), leading up into Saxon settlement on the site within Roman confines.

A third trend is regionalism of villa studies that was only possible in a small way in 1969. While it has its obvious advantages, problems develop in trying to select valid criteria to assess regionalism. Areas like Hampshire, Essex, N. Lincolnshire, the Nene Valley and the Verulamium area will exhibit tendencies, but one cannot help feeling that apart from the various criteria selected, comparative distributions of pottery, coins and place-name survival might have clarified the picture. Physical attributes of the villa alone (viz. D. J. Smith and Johnston) will certainly produce patterns of distribution; but what do they represent in real terms to the average Romano-Briton? This seems especially true since villa buildings alone do not fully reflect the status and rank of the *Possessores,* who often had business interests and other property elsewhere.

In these regional studies, the one aspect which seemed, curiously enough, to have been neglected, was the relationship between the town and country – always a possibility when one talks of villas alone. What was the reason and role for the towns around which the villas all cluster? What was the relationship between the Nene Valley villas and the communications (roads and rivers)? In short, one missed comment, or perhaps a paper on the role of the villa system – how all of these regions worked within themselves and within the greater administration.

Nevertheless, on its own grounds the book is a worthwhile complement to the 1969 book and does add further 'explanation' to the Romano-British villa. With a valuable series of villa lists and references, together with an extensive bibliography, this is well worth reading, although perhaps a little expensive at £7.25.

SIMON J. KEAY

INSTITUTE OF ARCHAEOLOGY LIBRARY

BROWN, David. *Anglo-Saxon England* (Bodley Head Archaeologies). London, Bodley Head, 1978. 112 pp., illus. £5.25.

There are two main faults in this book; it is far too readable, and far too open-minded. A general introduction to Anglo-Saxon England in 109 pages could be expected to be somewhat congested in style and decided in views. David Brown avoids the first hazard by writing directly to the reader, often out of his own experience, and avoids the second simply by posing the problem, and then saying, in so many words, 'but we do not know the answer'. This will no doubt earn him some rebukes from those who are quite sure that they do know the answer, for Anglo-Saxon archaeology is a subject in which the views of the writer are inevitably right, and the views of any opponent are obviously wrong. This unpleasant aspect of the subject makes no appearance in the book under review.

In order to cover the ground the subject has been split up into 10 short chapters which range from Anglo-Saxon origins to the coming of the Normans, passing on the way cemeteries, villages, South Cadbury, Sutton Hoo, churches, Vikings, towns, and the study of various types of object. In this last category comes a happy acknowledgement of the work of the late Calvin Wells on skeletal remains which includes his remarkable observation of six bodies in East Anglia with similarly trephined skulls, all of which were well healed at death. I wish the author had included Calvin's name for the presumed Master Surgeon – 'The Master of the Gliding Goudge'.

Not that everything in the book *has* to be believed. For the author, the end of the pottery industries of Roman Britain well before the Anglo-Saxon arrival, an important and seldom mentioned point, shows the 'chaos into which Roman Britain was plunged'. For the reviewer it is suggestive of change rather than chaos. For the author the end of Roman Britain and the beginning of Anglo-Saxon England are discrete events separated by a finite time. For the reviewer the change to Anglo-Saxon England began long before the end of Roman Britain. But this is hair-splitting on a subject on which the author's published view represents orthodoxy, and the reviewer's, heresy.

An impressively readable and orderly introduction to a wide and complex subject.

RICHARD REECE

GODWIN, Sir Harry. *Fenland: its ancient past and uncertain future.* Cambridge University Press, 1978. 196 pp., 44 Figs., 65 pls. Price not stated.

The Fens of eastern England cover a vast area from Cambridge in the south to northern Lincolnshire, and they represent even at the present time a worthy problem for geographers, botanists and archaeologists in their attempts to deduce the ancient history of the land. In this book, one of the pioneers of such research, and one of the inspirations of current studies, has set out his own views on the Fenland, its formation, previous and present uses, and its future.

'All the water of the middle part of England which does not run into the Thames or Trent comes down into these fens', said Defoe in 1724, and the entire history of the hundreds of square miles is inextricably bound up with water, with floods from inland rivers and from the sea, and now with the removal of water which threatens the whole region. Such landscapes have the virtues of stratigraphy, and biological remains, which have allowed Sir Harry and a band of others, working both in concert and in solo, to prescribe a history of Fenland landscapes and the living things that inhabited and exploited them.

The book now put before us is frankly autobiographical, and the better for it; it sets out the progress of the Fenland Research Committee, established in 1932 to elucidate all aspects of the even-then dwindling resource. Following two introductory chapters, the bulk of the book traces the history of scientific research and the establishment of the several phases of Fenland evolution, including human occupation. The science of pollen analysis in Britain was developed here, and the idea of collaboration of historians, geographers, botanists and archaeologists – the inception of interdisciplinary studies – was pursued vigorously through the years as differing aspects of the Fens were examined. Buried forests, the Buttery Clays, roddons, extinct meres and shellmarls, varieties of peats, all were discovered and analysed by members of the Committee. The prehistory and early history of man's occupation and exploitation of the Fenland was sometimes a deliberate archaeological study and sometimes only a part of another scientific project, but the collaboration of professionals and amateurs of whatever discipline is something to admire today, perhaps particularly today.

Most of the Fenland work was organised from Cambridge, and it is natural that most of the sites and sequences are in the southernmost part of the Fens; we still do not know how the stratigraphical successions in the northern area relate to the southern, and doubtless there is justification for a project concerned entirely with the Fenland of Lincolnshire. But it cannot today retrieve anything like a total record, as peat shrinkage, ably discussed and assessed by Sir Harry in the final chapters of the book, has already deleted from the record a major part of past history, and a significant part of

the flora and fauna of wetland character. Here is where timely words about conservation are set out, and we must hope that they are heeded before the modern descendants of those ancient species are themselves extinguished.

It is not the purpose of this review to attempt a summary of *Fenland*; the book is itself a summary of an enormous area and range of disciplines, as well as a portrait of a pioneer who saw the potential of the land and who with his collaborators set down the basis for research, today being undertaken by many persons from many institutions. The Fenland Research Committee has itself been revived in a modern counterpart which can introduce new approaches as well as building on the disciplines established by the pioneers. 'Any fool can appreciate mountain scenery but it takes a man of discernment to appreciate the Fens', so Sir Harry was told early on, and we can do no better than to accept the view and be happy that such a man of discernment was there at the right time.

J. M. COLES

SCULLARD, H. H. *Britain, outpost of Empire.* London, Thames & Hudson, 1979. 192 pp., 125 illus., 5 maps. £5.95.

This book is a very scholarly history of Roman Britain. As there are three terms of abuse in that sentence, in my own private language, I must in fairness add that it deals sympathetically with the archaeological evidence, uses it to eke out the historical sources when they become particularly thin, and is remarkably up to date.

It is not too difficult to fault Professor Scullard on tiny matters, which have little effect on the main stream of the book, but might be worth picking up. The Iron Age, dealt with by tribes, kingdoms, and aristocracies, faithfully follows the lines laid down by the coins, but there seems to be a minor confusion over the Dobunnic centre at Bagendon and the later civitas capital at Cirencester which did not exist, so far as we know, at the time of the conquest. The very recent change to the Chichester inscription concerning Cogidubnus, by which Professor Bogaers has shorn that Briton of his dual title of Rex et Legatus Augusti, is too late to appear in this book, yet Scullard must get a credit mark at this point. Most people just mention the inscription, perhaps they transcribe what it has always been held to say: Scullard duly reproduces the full drawing so that any critical reader can see that the titles rest most unsurely on a lacuna. Sheila Gibson's reconstruction of Chedworth is, rather mysteriously, given 'after Ward-Perkins' even though her signature is visible in the corner, and the omission of Colchester as a mainstream pottery centre means that the charioteer beaker is attributed, together with all such colour-coats, to the Nene Valley, and called Castor ware. The attribution of the Cirencester inscription renovating something 'to the old religion' is not securely dated to the reign of Julian; it just fits best at that time. The pictures are excellent; they make their points clearly and are always relevant to the text. So, if you want a scholarly history of Roman Britain you could probably not find a better one.

But I do not. Supposing that the coinages of the Iron Age are not reliable indicators of kings, tribes, aristocracies, or cultural leanings, or supposing that such indicators are only, as Professor Scullard admits, skin deep, what does this tell us about the origins of the majority of the population of Britain in the 1st and 2nd centuries AD? If villas, as a main branch of country dwellings, really do get going in the 3rd and 4th centuries, what was the settlement pattern before, and how did the necessary change come about? Did the invading Saxons really manage to rape, pillage and plunder practically the whole of Britain, finish off thriving cities, and change the face of the countryside? If there is more to the transition from Classical Britain to Medieval Britain than that where are the cracks in the present structure of unreason, and where is the fresh air likely to come in? Can we really keep the Northern Frontiers going on the supposition of vital bands of warring barbarians always squatting outside the Wall(s) waiting for the chance of a smash and grab raid without any information, except that gathered by the gallant and lone George Jobey, on their way of life? And if these are real questions which grow from real inadequacies in the standard sources, ought not a breath of them to creep into any books on Roman Britain?

Come my revolution such well-constructed and reasonable books as this will be banned (for they may be right) that my own brand of chaos and anarchy may prevail.

RICHARD REECE

JOHNSTON, David E. *Roman villas* (Shire Archaeology Series). Aylesbury, Shire Publications, 1979. 64 pp., 23 pls. £1.50.

In 19 pages of text, 25 figures, and 23 plates David Johnston 'does' Roman villas. The villas emerge relatively unscathed and readers will catch little harm, and some definite good, from this

simple introduction. When the whole booklet is so compressed there is no point in taking issue with words or phrases for they are more likely to be unwise choice of words than definite mistakes: better to review the tone of the seven short sections and the physical make-up of the publication.

The purpose of villas (farming units), simple plans, complex plans, and decoration rouse no great objections. 'Aisled barns and other buildings', however, is decidedly old-fashioned now that John Smith has thrown wide open the interpretation of villa buildings of whatever shape, size, structure, or plan. It is not necessarily wrong to make all aisled buildings into slave quarters, it just misses out one whole new aspect of interpretation. 'The end of Villas' is again rather conservative, and the standard chronology and terminology of 'sub-Roman' occupation leaves all sorts of interesting possibilities on one side.

It is with the format of the booklet that I would quarrel most. The explanatory text runs from p. 8 to p. 24 and the author was presumably severely limited in the number of words he might write in any section. Why then more than half a blank page on pp. 10, 13, 16 and 26? The figures and plates are printed on the same paper as the rest of the booklet so there is no excuse at all for cramming the figures and plates inconveniently together at the end.

The only misprint which could cause any trouble occurs on p. 17 where the bather passes 'through a warm room (tepidarium) – – –' and then get lost in the dashes, for the caldarium seems to have dropped out.

RICHARD REECE

RITCHIE, A. and G. *The ancient monuments of Orkney*. Edinburgh, HMSO, 1978. 81 pp., text plates and figs, map in end paper. £1.25 paper.

The question which should be asked about all archaeological guide books is at which section of the public they are aimed. Arguably it should not be at the archaeologist who has other means of access to the information but rather at a wider public for the majority of whom the guide will provide *the* source. Purchase of the guide presupposes in the buyer an existing interest in the subject, qualified by a greater or lesser degree of background knowledge, a combination of attributes epitomised by the evening class student. With guidelines suggested by a canvas of a group of such students, it is therefore interesting to assess Anna and Graham Ritchie's guide to the monuments in guardianship in Orkney on a basis of how much better it fulfils the requirements of the market than the 1952 guide which it replaces.

In addition to a rationalised gazetteer of the sites, it provides the additional information gained from work carried out on a number of sites during the intervening period and coincidently demonstrates the effect radiocarbon dating has had on the prehistoric chronology with the Neolithic occupation of the islands now starting almost 2,000 years earlier than the 1952 estimate. The student canvas indicated that a chronological framework was the most consistently desired feature for all types of guides; the new Orkney guide's introductory paragraphs satisfy this need very well, although a visual expression of the chronology in the form of a chart, preferably with relevant illustrations, would have been a useful addition to the booklet. This accent on visual interpretation was stressed by the students; plans of sites as complex as Broch of Gurness were welcomed but isometric drawings or reconstructions would be preferred to the rather repetitive ground plans, in this case with somewhat unaesthetic stipple, of the more simple monuments. Since scaled plans of each monument are included, measurements in the text are superfluous and intrusive, the more so when they are in metric measurements which do not make an instant visual impression on the as yet imperially minded majority of the readership. In this connection, a human or more readily recognisable scale in photographs is preferable to the use of a ranging pole whose length the layman invariably has to enquire. It is unfortunate that of only three illustrations of small finds included in the booklet two should feature Unstan pots and the third a rather over-sized illustration of stone and bone objects. A more representative range of finds from the sites discussed, easily fitted into the text on a small scale, could have added to the informative and stylistic value of the booklet. An indication of the present location of the finds, also stressed as high on the list of the layman's requirements, is unfortunately absent from this guide but there is the useful addition of a table of opening hours for the monuments. More practical information about the location of the sites, with comments on the lines of 'the site is a half-mile walk from the road along a grassy path', would be an asset and where monuments are signposted (almost without exception in Orkney) this should be stated. It is not advisable to assume the reader is necessarily equipped with the relevant Ordnance Survey map or with the ability to follow one.

Consequently there are a number of areas in which the guide could have been brought even further up to date with greater use of visual expression and less accent on details more relevant for the academic. However, the guide does give a current view of the monuments, set out in an attractive prose with the addition of excellent photographs. The structural division between gazetteer passages

giving full information on site and the introductory paragraphs providing further background reading is a very successful one. Other archaeologists will disagree with some of the views expressed, but this is inevitable for a guide which may, like its predecessor, have to stand for the next 25 years.

ALEXANDRA SHEPHERD

HOPE-TAYLOR, Brian. *Yeavering: an Anglo-British centre in early Northumbria* (Department of the Environment Archaeological Report 7). London, HMSO, 1977 (1979). xv + 392 pp., 123 figs., 111 pls. £33.00.

This volume records a major archaeological achievement: Dr Hope-Taylor has established that Yeavering was the site of Bede's *Ad Gefrin* where St Paulinus preached; conducted a most meticulous excavation, and reported the results in a lucid style which must make this one of the most well-written archaeological reports available. It begins with an outline of the topographic setting and the evidence which links the site with *Ad Gefrin* and enables a cropmark site two miles away to be identified as its successor *Maelmin*. There is an admirable statement of the excavation and recording methods employed. Feature fills were carefully recorded in plan and then dissected to establish the constructional techniques used in the large timber buildings. Much of this methodology could profitably be employed elsewhere.

Apart from its historical associations, what makes the site so important is the evidence of substantial timber buildings which were the first such buildings discovered in Britain that echoed the lavish hall described in *Beowulf*. The high quality of recording at Yeavering made it possible to ascertain that the buildings had been laid out in a very precise way, apparently employing a defined unit of measurement. This early metrological evidence might usefully be followed up by further statistical study. Other important archaeological remains included an assembly area, where it is plausibly argued that St Paulinus preached, two cemeteries and an enclosed area where, unfortunately, excavations could not be all that extensive with the result that the chronology and function of this part of the site is less clear than elsewhere.

A long section on the affinities of the timber buildings, which draws largely on continental evidence, is perhaps the least satisfactory aspect of the report. A delay in its publication has meant that few results from excavations in the last 15 years have been included, and during this period numerous sites with related structures have been excavated, particularly in England. Because some of this evidence is now out of date the arguments about the origins of the 'Yeavering style' and the typological development of constructional techniques are now in need of further critical reappraisal.

The volume concludes with a wide ranging survey of the historical setting of Yeavering which, with other sections of the book, shows us the compass of Dr Hope-Taylor's enquiry and draws on much interesting material relating to the problems of continuity in the dark ages and the varying contributions of Celtic, Roman and Anglo-Saxon tradition. Further emphasis is given to the scope of Dr Hope-Taylor's archaeological researches by references, in the text and footnotes, to his unpublished excavations which include major sites, such as Old Windsor, Greenstead Church, Bamburgh and Doon Hill. If Yeavering is anything to go by then these sites have been brilliantly excavated and it is very much to be hoped that reports on them, even if only of a summary nature, will be published as soon as possible.

Something must of course be said about the delays which have attended production of this impressive volume. The excavations were completed in 1962, the report contains few references to publications more recent than 1965 and the preface is dated 1969, finally the report has reached us in 1979. In the interim a few sections of the report have become out of date and the fruits of Dr Hope-Taylor's knowledge and experience were denied to people working on related sites and structures. It could be argued that what was needed, long before now, was a level IV report. Some of the material included in the present volume might then have formed the subject matter of separate discussion papers. None of these minor points detract in any way from the great work of scholarship which Dr Hope-Taylor has produced but they must lead us to question whether the combination of the Department of the Environment and HMSO is, necessarily, the most suitable way of publishing key archaeological sites.

MARTIN BELL

CANHAM, R. *2000 Years of Brentford.* London, HMSO, 1978. viii + 158 pp., 137 figs. £9.95.

This excellent monograph records the results of excavations in the late 60s and early 70s in Brentford. A brief historical account of the town, and descriptions of the local geology and finds of archaeological material are provided as an introduction to the excavations themselves. These are laid

out site by site, with all sections, plans and photographs usefully adjacent to the relevant parts of the text. The finds from the various trenches have been studied together, but the decision to make the finds reports stratigraphy dependent, and the clear system of cross-referencing has made it easy to relate individual artefacts to their contexts. However, it would have been a useful aid to research if this close documentation had been taken a stage further, and tables provided listing the contents of layers and stratigraphic units, along the lines of Harvey Sheldon's recent Southward report or, let it never be forgotten, of Pitt-Rivers' relic tables.

As to the publication of the volume, the standard of reproduction is high and the Museum of London and HMSO are to be congratulated on the production of a soft-covered, relatively good value-for-money report. If only the HMSO-published, DOE Archaeology Reports were produced in the same way!

ANTHONY KING

ORDNANCE SURVEY. *Map of Roman Britain,* 4th edn. Scale 1 : 625,000, about 10 miles to 1 inch. North and South sheet. Southampton, Ordnance Survey, 1978. 3 pp., 2 figs. £5.00.

The Ordnance Survey map of Roman Britain has always been an essential part of the academic apparatus of Roman archaeology in Britain, and the new edition can be expected to hold a similarly honoured position. It is the same as its predecessor in most of its layout, but differs in a number of important details.

The most immediately obvious change is the decision to make the map conform to the now standard 1 : 625,000 scale of the other period maps, thus necessitating a division of the map into two sheets. The topographical resolution is quite definitely enhanced by this move, but anyone wishing to make their maps into a convenient wall-chart, or wanting to use it in conjunction with the 1 : 1,000,000 sheets of the *Tabula Imperii Romani* is advised to hang on to the old 3rd edition. The other major change is, of course, the considerable amount of material added to the map, which reflects in a very graphic way, the large amount of fieldwork carried out in the 60s and 70s and recorded by the Ordnance Survey's Archaeology Division. This last clause is necessary, as it is apparent from a close study of the map that the distributions are compiled from the Ordnance Survey's card index of sites, which has not been kept as up to date as might have been desirable. In various areas known to the reviewer, more dots could have been added, and would probably have been so if the department had the proper resources to maintain close links with local sites and monuments records. However, this is a minor quibble when it is borne in mind that any map like this is out of date by the time that it is printed.

Various changes have also been made in features on the 3rd edition and in definitions of site types. On the plus side, some dubious roads and name attributions have been dropped, the symbol for isolated bath-houses, etc., has been given up, and the symbols for temporary camps, forts and fortresses have been clarified and expanded. On the minus side, the symbol for minor settlements has apparently been abandoned for all settlements away from roads, thus relegating many previously marked settlements and most new ones to the anonymity of a simple black dot. Valuable information on the distribution of the less Romanised occupation of Britain has been lost to the researcher by this decision. Additionally, the rather uncertain term *burgus* has been introduced to designate some late Roman enclosures. Thus, Bitterne is a *burgus,* but Portchester, with a civilian occupation now established for part of the 4th century at least, remains a fort. The old definition of lesser walled town would have been a more prudent choice for most of the *burgi* marked, the justification in the accompanying text for their inclusion being not very convincing. It is also a pity that most of the 3rd edition's text maps have been omitted.

In general, however, archaeologists in Britain should count themselves very lucky that the government continues to subsidise and produce such specialised maps, mainly for a professional market. This latest offering by the Ordnance Survey is well up to their usual standard, and could on its own justify the continuance of the valuable service that the Archaeology Division provides.

ANTHONY KING

JOHNSTON, David E. *An illustrated history of Roman roads in Britain.* Bourne End, Bucks, Spurbooks, 1979. 158 pp., 30 figs., 38 pls. £5.00.

BAGSHAW, Richard W. *Roman roads.* Princes Risborough, Shire Publications, 1979. 64 pp., 8 figs., 57 pls. £1.50.

These two books are intended to serve as short introductions to the study of Roman roads in Britain without going into detail of roads in the field, except where selective examples are described.

Acknowledgement of the debt due to Ivan D. Margary by all students of the subject is made by both authors, whose expansion in these books of his general survey in Chapter 6 of Volume 2 of *Roman roads in Britain* would undoubtedly have met with the great man's approval. They follow hard on the heels of Raymond Chevallier's *Roman roads* (1976) but concentrate on Britain and aspire to stimulate an interest in the reader, followed by fieldwork, responsible excavation and publication.

Over half of Mr Johnston's book is concerned with a review of the present knowledge of the nature and context of Roman roads. The history of research in Britain is outlined with a refreshingly broadminded assessment of ley lines and amusing notes of enduring folklore memories of ghostly, marching legionaries. The history and function of roads in the Roman empire, and the development of the network in Britain are described with emphasis on the two main factors in this: the military organisation requiring supply lines and the natural growth of commercial routes. Discussion follows of how and by whom they were surveyed and constructed. The latter part of the book describes selected portions of roads around Britain with a view to visits by the reader and ends with a section outlining methods of research and excavation.

Mr Johnston's illustrations are excellent, although they are not related to the text. The text is concise, informative and stimulating to read but suffers from an absence of references and an excess of dogmatism; both drawbacks deriving from the nature of the book as a general introduction. The first may be excused by some, but it must be regretted that a study which sets out to further a subject as an area for research in its own right has to rely on a select bibliography alone. For example, there is an interesting discussion of Ian Hodder's theories and of the development of road networks in recent colonial contexts, which the general reader would have difficulty in following up. By comparison with some other archaeological literature, it may be unfair to criticise the author for excessive dogmatism, because the very nature of the study renders the distinction between fact and opinion more difficult. However, the subject of Roman roads is so contentious, the evidence often so scanty and the opportunities for mixing fact and hypothesis so frequent that the archaeologist has a special duty to ensure that the two areas are kept quite separate. In this Mr Johnston is mostly successful, and it cannot have been easy, but in one area he seems to have overstepped the mark. In his discussion of the development of the road network, he gives the impression that the picture we have is substantially complete, whereas the subject is little explored and defined, and much work and refinement remains to be done. The interaction between the military and civil authorities, as well as private landowners, is scarcely known in so far as road building is concerned and the dating of the construction and repairing of roads is crude at present. The influence of any pre-existing roads and the minor gradations of Roman roads are both areas where much remains to be determined. Mr Johnston also fails to allow for the unknown in denying a fort at London and assuming that none of the Roman settlements between Colchester and Godmanchester have a military origin; and Danebury is not on the route from Silchester to Cirencester.

Mr Bagshaw avoids such difficulties by keeping his interpretative text to a minimum and concentrating on a factual account of fieldwork and documentary research techniques and a fine selection of black and white photographs, which comprise over half the book. He presents an outline of the history of past research, which includes a plea for open-minded co-operation between professional and amateur archaeologists and a note of the importance of air photography. This is followed by a description of the form and construction of Roman roads and a detailed section describing how to set about research using evidence of maps, placenames and surface evidence, and how to follow this with excavation, recording and publication.

The 57 plates are interesting and informatively captioned, although they might have been restricted in number without detracting from the information conveyed; the general reader might find picture after picture of Roman roads on the ground and from the air slightly enervating, however interesting to an archaeologist. Although the author notes that it is only recently that the professional archaeologist has considered Roman roads as part of a composite picture of landscape archaeology and related sites to roads and vice versa, he is too stringent, in one respect, in stating that a road cannot be considered Roman unless it joins two Roman sites. His point is valid that the evidence should be substantial and factual before an ancient road is acknowledged as Roman but it is also feasible for a road to be established as Roman and in itself lead to the location of Roman sites. A case in point would be in the study of Roman military sites in Wales, where as recently as 1969 the second edition of *The Roman frontier in Wales'* was published with scarcely any consideration of Roman roads in Wales and their part in the military history of the area. His pleas for objective consideration of the significance of the placenames 'coldharbour' and 'folly' are valid, and that for the Bertram map of the 18th century may be so, but his idea of a Roman provincial road grid on an arbitrary basis is fantastical.. He suffers from the same problems of generalisation as Mr Johnston and gives the impression that variations in layout and construction were strictly limited, whereas the road network probably consisted of an infinite variety of all types, Roman and pre-Roman, and we have probably only recognised the most obvious, substantial roads; this general problem is not faced in either book and it will not be until some objective dating method has been perfected, perhaps archaeomagnetic dating

of roadside ditch silts, that it will be resolved. Even then, some roads did not have side ditches. Both books omit to mention the importance of considering Roman roads within the modern framework and eliminating relatively modern organised systems such as turnpikes when pursuing fieldwork. Even such a sacrosanct 'Roman' road as that over Blackstone Edge can be doubted when such possibilities as that road being a turnpike of 1734 have a convincing case made for them (H. C. Collins, *Country Life,* November 22nd, 1979, pp. 1888–9).

H. S. TOLLER

SORRELL, A. *Roman towns in Britain.* London, Batsford, 1976. 80 pp., illus. £4.25.

BURKE, J. *Life in the villa in Roman Britain.* London, Batsford, 1978. 120 pp., 82 figs. £4.25.

These two books from Batsford are devoted to the two poles of Roman Britain, the town and the country. There their resemblance ends for the work by Alan Sorrell is marked by exact attention to detail, whereas the work on villas is marred by a complete disregard, not only of detail, but of all the main lines of the subject which it professes to cover.

Alan Sorrell's work of reconstruction on the buildings of Roman Britain, and beyond, has been for a long time the delight of the reader, and the bane of the excavator. The delight of the reader because through these drawings it has been possible to get an informed idea of what certain aspects of Roman Britain may have looked like; the bane of the excavator because Sorrell was meticulous in basing his drawings on the exact detail which the excavator had recovered, and just as often as not the excavator had not recorded that vital piece of evidence which Sorrell needed to justify his essay. As Sorrell himself insisted, the phrase 'artist's impression' or guilty paraphrase 'imaginative reconstruction' are wrong: these are architectural reconstructions.

One main aspect of Sorrell's work is missing in this book, and that is colour. For me that is one of the main attractions to his work, and it must be admitted that 26 of his drawings all in black and white do seem a little monotonous. It is often said that the sun shines only fitfully on Roman Sorrell, meaning that smoke, mist, rain, snow and glowering clouds form the background to all his pictures. Again, he has answered this criticism himself, by pointing out that Roman architecture is so square and formal that it needs a natural foil of romanticism. I agree. And look at the dividends that this policy pays on p. 37 where a full-plan picture of Verulamium has two shafts of light running down the excavations of Wheeler and Frere, with the intervening ignorance hidden in the deep shadow of a passing cloud.

Two shafts of light from Batsford are the books by Anthony Birley on *Life in Roman Britain,* and by John Percival on *The Roman Villa.* But *Life in the villa in Roman Britain* is very much a deep shadow; let us hope that it is only a passing cloud.

p. 79: 'When the continental frontiers of Rome were pushed back by barbarian assaults in the third and fourth centuries (virtually wrong – only in two cases did the frontiers move), most of the Gaulish factories were destroyed (no evidence, completely unjustified) or abandoned (*most* might well have stayed in some sort of production if not of Samian pottery) and another British attempt to produce a substitute Samian ware was made around Oxford, using artificial colouring (wrong, but I have no idea what he means) and then glazing it (certainly not) to match as closely as possible the real thing'.

p. 86: 'there were also several silver coins in general use' (in the 1st to 3rd centuries – no, only the denarius); 'the original mints for supplying Britain were in Gaul' (no, in Rome); '. . . copies issued from British sources: samples of silver denarii probably rushed off the presses to pay the army, have been found at Fishbourne' (definitely wrong, but, again, I do not even know what he intended to say). There are at least three more errors of fact on that half page.

The illustrations are a motley bunch. p. 39, showing the Chedworth baths, has the caption '. . . hypocast . . . and a more recent form of heating in the top left-hand corner!' Unfortunately the block of wood which keeps out visitors has been mistaken for a blower heater. The facing line-drawing of a stoke-hole would, I suspect, not work because the fire is several feet below the level of the base of the pilae. The 'wine growing estate' shown on plate 53a has little relevance to Britain, despite its attribution to the Bards (*sic*) Museum. In plate 47 it would have been easier for the uninitiated if the plate had been shown with the Chi-Ro at the top. Enough.

The Batsford archaeological authors, who include many excellent excavators, ancient historians, and writers must be acutely embarrassed by this addition to their list.

RICHARD REECE

GUIDO, M. *The glass beads of the prehistoric and Roman periods in Britain and Ireland* (Society of Antiquaries Research Committee Reports 35). London, published for the Society of Antiquaries by Thames & Hudson, 1978. xxxi + 250 pp., 38 figs., 4 pls. £20.00.

In this volume, the author examines in great detail the glass beads from the Bronze Age (few though they may be), the pre-Roman and Roman periods, focusing primarily upon Britain and Ireland. The first chapter of the book is concerned with technical aspects of this subject, such as the actual methods of manufacture of the beads and the manufacture and colouring of the glass itself (pt. 1) and the second with the archaeological considerations (pt. 2) – pointing out the problems related to such a study.

Though formally confining this study to Britain and Ireland, the author frequently draws our attention where necessary to parallels and possible sources on the continent as well as to beads of post-Roman date and of other materials. The pre-Roman beads are divided into two main groups; those of continental origin or inspiration (pt. 3) and those of British design and origin (pt. 4). The author identifies and discusses in detail 14 classes (with subtypes) of readily definable examples and 8 groups (again with subdivisions) of beads which do not have satisfactory homogeneity of style and design to allow better classification but which should allow a basis for the definition of further classes in the future. The proportionally greater amount of material from the Roman period (pt. 5) is subdivided according to shape and colour and includes the overlap of two earlier groups. The final 145 pages is given up to the schedules, which if they had been condensed or perhaps tabulated might considerably have reduced the size and (if only) the cost of the volume. Throughout the book, the beads are well illustrated and mapped and the inclusion of four colour plates, also by Mr Nicholas Griffiths, well assists the reader's understanding of the subject.

Authoritative and detailed though it may be, I am sure that the author would be the first to point out that there are many aspects of this subject, especially during the Roman period, which require further work – possibly resulting in modifications to her observations and results. The employment of the chemical analysis of beads, in which the author appears to have great faith, will probably only assist the understanding of the more distinctive pre-Roman and 'exotic' Roman examples because unless a sufficiently large sample is analysed the contamination of the glass as a result of the use of cullet (waste glass) will considerably distort results. The Roman period, with the vast increase in the use of glass for domestic purposes, will be more susceptible to this problem and the very nature and colours of the majority of Roman beads suggests to me that numerous local craftsmen were taking advantage of cullet, the reworking of waste glass requiring a reduced melting time and lower temperatures than the fusion of raw materials. However, we must await the results of the analyst.

This pioneering volume has certainly tackled well the problems of pre-Roman and Roman beads as entities. It is a fine achievement following work 20 years ago by Haevernick on La Tene glass ornaments and we await with anticipation the results of the author's current research on post-Roman beads. From experience, this volume is of great value to the glass specialist involved with site reports. Finally, I feel that a volume such as this justifies the work carried out by those who spend much research time sifting and examining museum collections in Britain and abroad and gathering detailed information from published sources and correspondence.

JOHN D. SHEPHERD

WARD, S. and STRICKLAND, T. J. *Excavations in the site of the Northgate Brewery, Chester 1974–5: a Roman centurion's quarters and barrack.* Chester, Chester City Council, Grosvenor Museum, 1978. 32 pp., 28 figs. £1.25.

This small addition to the literature on Chester Legionary fortress covers two seasons of excavations on a site in the north-west corner of the base, which revealed remains of centurions' quarters and barrack blocks. The restricted area of the site and later disturbance of the Roman stratigraphy place considerable limitations on the establishment of a detailed and reliable picture of the development of this part of the fortress interior. The somewhat limited dating evidence and damage to the later phases mean that the results of the excavations have made no significant impact on our interpretation of the base as a whole. Nevertheless they are a useful addition, not least in terms of our knowledge of the interior layout, since it confirms the assumed continuation of barracks from the *via decumana* towards the north-western angle.

The publication is in fact a summary final report, in line with a policy of abandoning full publication in favour of a short report and a freely available archive. It contains no section on finds *per se*, but the foreword announces a proposed series of 'object-oriented . . . studies' instead. This is certainly a good idea, but surely a brief section on the few coins and sherds mentioned as dating evidence in the text could easily have been included. As it is, students wishing to see the evidence

must either consult the archive or await the projected 'object-oriented' studies. Such formal separation of sites and artefacts is, in this case at least, inflexible and inconvenient.

Finally, the decision to produce reports as monographs in this cheap paperback format may be economical, but leaves a lot to be desired in other directions. The claim that a series of these, rather than putting the future summary reports in existing journals, will be easier for students is highly dubious. The journals are readily available in major libraries, and the latter are unlikely to take kindly to such a series if they are to be in this format, which is not up to the standard one often finds of interim reports, let alone final publications. Perhaps the Grosvenor Museum would do better to collect its future summary reports together in a well-produced volume rather than publishing isolated paperbacks which can have only a limited shelf-life.

SIMON JAMES

CLEMOES, P. (*ed.*). *Anglo-Saxon England,* Vol. 7. London, Cambridge University Press, 1978. x + 303 pp., 27 figs., 4 pls. £17.50.

This annual series is now well established as a place of publication for papers on all aspects of Anglo-Saxon England, conveniently bringing together studies on history, literature, art and archaeology that would otherwise appear in journals devoted to these individual disciplines. In addition, its classified bibliography of publications on Anglo-Saxon studies (here listing over 730 items for 1977) is invaluable.

Whilst archaeologists may recoil from the more technical papers on literary and linguistic subjects (and the inevitable plethora of *Beowulf* articles), those of purely historical and archaeological interest have been of high quality if few in number.

In this volume there is another of Harrison's ingenious contributions to problems of chronology, with a practical suggestion on the observation of the equinox so as to calculate Easter correctly. Kitson's examination of the Old English lapidaries provides a new insight into contemporary attitudes to jewellery whilst the significance of holy places in pre-conquest England is discussed in Rollason's analysis of text listing the resting places of saints. After the literary studies numismatics is represented by Keynes' reinterpretation of the PACX/PAXS legend as an invocation of Christ rather than simply *pax.*

On more directly archaeological themes are two major studies, the first by Alan Carter. In 'The Anglo-Saxon origins of Norwich', Carter reassesses an old problem, appropriately introduced through a careful review of the historiographical background, and advanced by a most judicious use of many types of evidence provided by historical, topographical and archaeological work on the city. It is an excellent example of the results that are beginning to emerge from the renewed interest in urban history coupled with intensive archaeological work in the field. The second study, 'Anglo-Saxon Carpentry' by Cecil Hewett, is an adventure into an entirely new area. From his pioneering work on later Medieval carpentry, where Hewett has not only observed what no one had looked for, but has structured his observations into a rigid archaeological type sequence (his critics would say too rigid), he has now taken back the sequence into the pre-conquest era. Here for the first time are joinery details from doors and windows, and most intriguing of all a full discussion with many illustrations of the roof on the 'Rhenish helm' at Sompting; a roof that was never before examined because it was believed not to exist! The roof is apparently primary, and is certainly ancient and of appropriate construction, though its actual date could only be determined by scientific methods. This paper is a major development in the study of Anglo-Saxon architecture, and it has already been followed up by further work with discoveries of great importance.

The volume concludes with two papers on manuscripts, one by Robinson who identifies self-contained booklets surviving in large bound volumes, and a review article on decorated manuscripts that seems a little self-indulgent in the length of its footnotes. As is to be expected with products of the CUP this volume is of high quality (and price).

JULIAN MUNBY

BATEMAN, Thomas. *Ten years' diggings in Celtic and Saxon grave-hills (1861).* Buxton, Moorland Reprints, 1978. xiv + 307 pp., illus. £8.00.

Thomas Bateman died in 1861 before he reached 40, yet during his lifetime he was reponsible for the excavation of over 400 barrows – a record which puts him alongside the other great barrow diggers of the 19th century, Hoare and Cunnington before him, Greenwell and Mortimer after him. Most of Bateman's work was carried between 1843 and 1860, and the results of the first four years (1843–7) were published in 1848 in the *Vestiges of the antiquities of Derbyshire.*

Ten years' diggings, published only two weeks before his death, reports the work of Bateman and his two colleagues, Samuel Carrington and James Ruddock, in Derbyshire, Staffordshire and Yorkshire from 1848 to 1860. Although it was written almost 120 years ago, it is still an important source book for anyone interested in the later prehistory of the region. A pioneer work of its time, the book contains meticulous plans of the interments within the barrows, and even sections of the mounds themselves, for example on pages 60 and 63. The appendices on human and animal bones, pottery, rocks and vegetable matter are the forerunners of the specialist reports which are mandatory in all excavation reports today. Bateman himself set much store by them, remarking on 'the extreme improbability of any future writer having the opportunity of examining so large a collection of ancient (Celtic) crania and vases, arising from the rapid disappearance and exhaustion of the sources of discovery, from causes constantly in operation, among which we include agricultural improvements and the ill-conducted pillage of idle curiosity'.

Bateman introduces his volume with an essay on barrow burial on a global scale, including the Americas, which reflects the breadth of interest of the educated Victorian mind. Bateman's approach to excavation was well ahead of its time, as he shows in his introduction, where he remarks that 'we exhume materials for the reconstruction, or rather for the elucidation of the history of mankind . . . '

The major part of the volume is devoted to accounts of Thomas Bateman's own barrow excavations between 1848 and 1860. It also covers those of his 'proxies' – Samuel Carrington in Staffordshire from 1848 to 1858, including his work on the settlement site at Wetton, and the barrows opened by Ruddock in Yorkshire from 1849 to 1858. The quality of these accounts, together with the appendices, make *Ten years' diggings* still indispensible to anyone studying the Bronze Age of the three counties covered. It is also of considerable interest to those concerned with barrow burial in general.

The reprint of this volume, published by Moorland, faithfully reproduces the original, though the dedication is omitted. A concise and sympathetic biography of Bateman by Barry Marsden precedes Bateman's own brief preface in which he states, very commendably, 'that theory . . . has been avoided, and that the very few deductions I have ventured to make from recorded facts are either demonstrable, or such as may be fairly inferred'. Bateman writes engagingly and among the delightful woodcuts which illustrate the volume is the famous upright burial in a stone-built barrow at Parcelly Hay (page 23). It is good to have a reprint of this important source book, and at a price which will make it attractive to individual readers, as well as the libraries.

P. M. CHRISTIE

COLLINGWOOD, R. G. and WRIGHT, R. P. *The Roman inscriptions in the Grosvenor Museum Chester* (reprinted from *The Roman inscriptions of Britain*, Vol. 1. Oxford, Oxford University Press, 1965) with addenda by G. Lloyd Morgan and D. J. Robinson. Grosvenor Museum, Chester, 1978. 44 pp., 128 figs. £1.25.

The Grosvenor Museum Chester have sensibly decided to reprint the relevant sections of Collingwood and Wright, *The Roman inscriptions of Britain* (*RIB*) rather than issue a revised catalogue which would have been an expensive and largely pointless undertaking. At the same time the opportunity has been taken to add two appendices of addenda, one to nine of the transcripts of the inscriptions by D. J. Robinson and the second to twelve of the descriptions of the reliefs by G. Lloyd Morgan. For the most part the points that they make are valid and some, such as the dubious nature of the restoration of the building inscription, *RIB* 464 are important (much has been argued from the supposed Trajanic date of this particular stone). There are however four points at which the production can be criticised. Firstly, some of the inscriptions and reliefs in *RIB* are illustrated by photographs rather than line drawings, and these photographs have not been republished. This means that comments on the iconography of *RIB* 491 and 538 can only be checked by reference to *RIB* itself or the original museum catalogues. Secondly, although the authors have made their own comments they have ignored those of the reviewers of *RIB*, E. Birley (*JRS*, **56**, 1966: 226–31; G. Alföldy, *Bonner Jahrbücher*, **166**, 1966: 638–45; and A. Deman *Latomus*, **26**, 1967: 139–50), who together discuss 16 of the Chester inscriptions. Thirdly, they do not include the 14 inscriptions on stone published (in *JRS* and *Britannia*), since the appearance of *RIB* I. Fourthly, they miss the opportunity of producing classified indexes to the Chester material which would have enhanced the value of the republication. Nevertheless, the idea of reproducing a section of *RIB* relating to a particular site is a good one, and it is an example which, if the sort of criticism given above were taken into account, could well be followed.

M. HASSALL

FROOM, F. R. *Wawcott III: a stratified mesolithic succession.* Oxford, British Archaeological Reports, 1976. 209 pp., 85 figs., tables. £3.90.

This volume describes the excavation of a mesolithic site at Wawcott in the Kennet Valley between Newbury and Hungerford. It is probably the most analytical report to have appeared on any British mesolithic stone industry particularly in that as much emphasis is laid upon the debitage products as upon the backed blades, discussion of which usually forms the centre of any report on a site of this age.

Froom discusses and describes an assemblage of some 90,000 struck flints recovered from between 10 and 12 horizontal spits each two inches thick within an excavation covering an area of 33 square yards. This material was excavated from within a 'featureless silt' deposited by floods (p. 10) which filled a channel eroded into flood-plain gravels and overlapped its edges. This flood-deposited silt incorporated flints left behind on working floors and the floods which left it may have been the cause of temporary abandonments. Evidence that human groups may not have deserted the site for long is drawn from the fact that sterile silt bands could not be identified separating artefact concentrations, also from the position of knapping centres which it is suggested fall within the same (horizontal) transects one spit to another as one ascends the sequence – a proposition, *pace* the excavator, not supported by Fig. 7. Two small artificial pits were identified whose functions could not be determined but both are certainly too small to have served as dwelling pits.

No organic finds were made apart from a small number of carbonised hazelnut shells and the only objects not of flint are a sandstone 'rubber', a sarsen hammerstone, a chert core, and a bifacially flaked 'blade' of slate most probably originating from the Hangman Grits of North Devon and representing one of a group of trade objects dispersed during the sixth and fifth millennia as far east as Hampshire, Sussex and perhaps Essex.

The microlithic component is clearly not the same at the base of the silts as towards their top and the excavator believes that it is possible to recognise four stages within the sequence of two inch spits.

Base.	Spits J, K, L:	Dominated by obliquely blunted points.
	G, H, I:	Moderate obliquely blunted points: isosceles triangles dominate over scalene forms: basally retouched points appear in spit I.
	E, F:	Moderate obliquely blunted points. Scalene triangles dominate over isosceles forms.
Top.	Spits A, B, C, D:	Low obliquely blunted points: relatively high representation of scalene triangles.

The trends visible within this sequence are immediately reminiscent of those detected within the Weald although in the latter area one is arranging single period sites in a seriation, not attempting to extract patterning from a site where sterile bands are absent and potential mixing of material of various phases within a biologically active soil profile appears inevitable. The Wealden Sequence can thus only be expected to be recognised in 'ghost' form. It is, however, quite clear that the absence of all but totally 'suspect' later microlith shapes from spits J, K and L indicates on the basis of other local evidence use of the site during the eighth millennium bc or at latest the early centuries of the seventh.

Equally a radiocarbon determination of 4,170 bc ± 134 (Bm 767) for charcoal and hazelnut shells from the base of pit II taken together with rare examples of such specifically late microlith shapes as 'four-sided' forms (Fig. 59, no. 44) confirms use of the site as late as the fifth millennium bc. The contents of the group of spits G, H and I with many obliquely blunted points, more isosceles than scalene triangles and the first appearance of basally retouched points including our more strictly defined 'Horsham points' is reminiscent of the microlithic composition of 'Wealden sites' which one would wish by continental analogy to assign to the seventh millennium bc.

Interpretation of this microlithic sequence, as with all the other statistical data presented in this volume, depends on four assumptions: firstly, that there has been no major break in the occupation of this site, something which I suspect cannot be empirically demonstrated. Secondly, that there has been no mechanical mixing of the artefacts. Thirdly, that the spits are managing to separate out assemblages, and are not in fact masking occupational interfaces and cutting across them. Fourthly, that the silt deposits are in fact horizontally bedded over substantial areas and that it is a realistic procedure to excavate them by means of a rigorously horizontal spit system spread over an area as great as 33 square yards. It cannot again be demonstrated that the surface of these river-laid deposits would not have been irregular or even subject to locally variable patterns of erosion or deposition.

It is particularly encouraging given the problems facing the interpretation of material gathered from within such an unhelpful and apparently structureless deposit that the trends within both the microliths and debitage investigated in such painstaking detail by Roy Froom should agree so well with the patterns emerging from comparing various aspects of the lithic material particularly debitage

from groups of single period sites in south-eastern England (Pitts, 1978; Pitts and Jacobi, 1979). Probably the mesolithic archaeologist could be faced with no more complex a site to interpret that Wawcott III with human activity over upwards of three millennia compressed into a deposit up to only 24 inches thick.

It is perhaps a pity that the vertical distribution of other tool forms are not investigated in the text in as much depth as those of the microliths and the debitage, since much might have been learned of changing site function as well as technological developments with time. It would be particularly interesting, for example, if assemblage composition, expressed as major essential tool classes, remained constant through time while projectile equipment, as represented by the microliths, evolved quite noticeably. However, it says much of the thoroughness of this report that the data essential to resolving this problem can quickly and efficiently be extracted from the tables at the back of the volume.

The report cannot be overpraised for the wealth of drawings which it contains and for the very clear way in which a mass of numerical data are presented. The author deserves every congratulation for undertaking such an exhaustive study on such difficult, and to many others apparently unyielding material. It is a pleasure to know that reports on other, single period, sites in the Wawcott area are on their way, and once again this volume only serves to stress the role played in the mesolithic archaeology of this country by people working on their own initiative.

R. M. JACOBI

WILKES, J. J. and ELRINGTON, C. R. (*eds.*). *The Victoria History of the County of Cambridge and the Isle of Ely. Vol. VII. Roman Cambridgeshire.* London, published for the Institute of Historical Research by the Oxford University Press, 1978. xiv + 98 pp., figs. in text, 16 pls. £20.00.

I approach this book, not as a Romanist but as someone who works in the area and needs to keep up to date with work in all periods. Viewed from this point of view the book is not very helpful. The binding and title page are, as usual, very impressive but the contents are disappointing. Firstly, there seems to be some confusion surrounding the area to be covered by the book. The text, written by D. M. Browne, is sub-titled 'Roman Cambridgeshire' and the official position is clearly stated in the Editorial Note: the counties are identified as they existed on 31 March 1974. Two maps in the early chapter on the physical environment illustrate the whole county, but all the other maps illustrate an area identified as 'The Cambridge Region'. Rather confusingly this area does not coincide with Cyril Fox's 'Cambridge Region' and is not tied into the National Grid. The second point which is worrying is the low standard of art-work. The maps are drawn to a scale of less than ¾ in. to 5 miles and each one is approximately 5 in × 4 in which tends to lessen their impact as illustrations as well as their usefulness as sources of information.

There is little in this book that is not covered elsewhere and more fully in a few standard texts (e.g. Phillips, C. W., 1970, *The Fenland in Roman Times,* Royal Geographical Society Research Series No. 5). There are parts of this Victoria County History which are taken directly from these sources (compare the entry on the Fen Causeway, this volume, p. 22, with the entry in Margary, I. D., *Roman roads in Britain,* Vol. 2, 1957, p. 202, for example). There are a few remarkable statements which appear to be original to Mr Browne, notably his description of the Fens as 'treeless' and his suggestion that salt production ceased in the area in the mid-2nd century because of a possible shortage of peat for fuel.

The cost of this volume is prohibitive: £20 for 92 pages of text. Obviously it will be purchased by libraries, institutions and wealthy antiquarians. It will not be purchased by people actively working in the area who want something new to add to their bookshelves.

MAISIE TAYLOR

ALICU, Dorin, POP, Constantin and WOLLMANN, Volker. *Figured monuments from Ulpia Traiana Sarmizegetusa.* Translated from the Romanian by Nubar Hampartumian (BAR Int. Ser. 55) (Sarmizegetus Monographs 2). Oxford, British Archaeological Reports, 1979. 211 pp., 169 pls. £12.00.

This second BAR monograph on the Dacian colony is a welcome addition to our knowledge of Roman provincial culture. It assembles a corpus of 551 identified items of figured sculpture, mainly in the museums at Sarmizegetusa and Deva, and a further 108 pieces now lost or known only from antiquarian drawings or descriptions inadequate to permit present identification. The well-arranged entries include brief but sufficient descriptions and full bibliographic references, following the form of those in the *Corpus Signorum Imperii Romani* fascicules; they give equal academic value at a much

smaller price than recent *CSIR* issues. My only complaint is that it is not usually stated where chance finds of pieces now located elsewhere than Sarmizegetusa were made. Most of the items are illustrated, on the whole quite adequately, given the cheaper process of reproduction.

The catalogue is prefaced by an introduction and six scholarly, concise but informative chapters analysing the various categories of sculpture. The introduction usefully summarises published work on the sources of stone and on possible local workshops. The latter are distinguishable by stylistic features rather than by 'truly original types'; the arguments seem sensible, though some of the more condensed are difficult to test without reference to the cited publications. Peltas terminating in griffins' (properly, eagles') heads in the side panels to inscriptions occur in the Rhineland and Britain, however (cf. *RIB* 980, 1428, 2173), and are not, as apparently implied on p. 4, a local peculiarity.

Roman provincial culture in Sarmizegetusa reveals little native influence, to judge from the overwhelmingly classical or oriental nature of the deities and mythological characters which account for over half the catalogue. The commentary on these sculptures will be of particular interest to students of provincial religion, notably the important group from the recently excavated sanctuary of Aesculapius and Hygieia. These, incidentally, are the deities to whom Cat. no. 7 was dedicated, not Hygieia and Telesphorus, as is implied on p. 11. Also, since it is most of Hercules' leg, not just his foot, which measures 1.06 m (no. 36), a misleading impression of his size is given on p. 14. Such errors seem few, however, though one gremlin has transposed the section on Sphinxes (pp. 40–1) to the middle of that on Stelae and Altars which it should follow. For 'tronans' (no. 48) read 'tonans', and Diana (2, 4) on p. 14 should be no. 24. Presumably no. 248, like other pieces at Satul Poiana, was brought there *from* Sarmizegetusa, not vice versa.

Useful indices include ancient proper names, deities and localities mentioned. Some of the last appear on the map of the territory, which if extended marginally further north would advantageously have included Apulum, cited several times for its comparative collection. A helpful frontispiece plan of Roman Sarmizegetusa and its monuments is for some reason repeated as pl. clxv. Nubar Hampartumian's translation is readable and workmanlike, though small nonsenses under Mars (p. 16) and Cat. no. 528 have escaped the editorial eye. Minor criticisms detract little, however, from an appreciation of a thorough and informative publication.

T. F. C. BLAGG

TODOROVA, H. *The Eneolithic in Bulgaria in the fifth millenium B.C.* Translated from the Bulgarian by Vessela Zhelyaskova (BAR Int Suppl Series 49). Oxford, British Archaeological Reports, 1978. 127 pp., 15 pls., 32 tables. £4.70.

As H. Todorova comments, 'the Eneolithic is one of the most remarkable periods in the prehistory of South-eastern Europe'. Her brief survey of the archaeological evidence, much of which is still unpublished, concentrates on results of excavations in Bulgaria but does not ignore related developments in neighbouring lands.

According to calibrated ^{14}C dates, which Todorova uses although with some reservations, the era lasted from the late sixth to the late fifth millennium. It saw the rise of urban communities, a powerful and wealthy patriarchal society with a strong feeling for beauty in their artefacts. It was also marked by an industrial revolution involving large-scale copper mining and metallurgy. Probably for reasons of space the ending of the period is not discussed, but useful appended tables and maps *inter alia* demonstrate its drastic nature and suggest it was caused by eastern invaders.

Regional variations of pottery are treated at some length. Here more illustrations and dimensions would have been helpful, although only colour can do justice to the decoration of the fine graphite painted pottery. An analysis of the cemeteries of settlements at Golyamo Delchevo and Devnya excavated by the author and of Vinitsa, excavated by A. Raduncheva, is an especially useful contribution to our knowledge of the period and has hitherto been available only in Bulgarian.

Todorova has in general commendably confined herself to presenting facts, but her interpretation of the data accumulated on Eneolithic diet, while interesting, rests on assumptions that must be considered controversial. We still know little, apart from such fundamental activities as farming, hunting and metallurgy, of the social and economic factors governing life at this time.

The translation is generally adequate but stricter editorial supervision would have corrected such statements as 'The Early Eneolithic population of North-eastern Bulgaria lived in houses built on flooded terraces' or 'They knew how to build settlement mounds, ground-level houses and how to farm by water sources'. These must not be attributed to so careful and experienced an archaeologist as the author of this useful introduction to an exceptionally interesting era of European prehistory.

R. F. HODDINOTT

GLODARIU, I. *Dacian trade with the Hellenistic and Roman world* (BAR suppl. Series 8). Oxford, British Archaeological Reports, 1976. 275 pp., 55 pls. £6.80.

Dacia, as one of the most developed and powerful barbarian kingdoms on the periphery of the Graeco-Roman world, has at last been the subject of a specialist study in English which assembles the archaeological evidence for Dacian trade from the 4th century BC down to the Trajanic conquest. Glodariu arranges his material into a corpus of imported Graeco-Roman products (including local Dacian imitations) and five principal chapters in which the evidence is discussed typologically and chronologically: 1, trade in Hellenistic and Roman goods (wine, oil, pottery, bronze and silver objects, glass, coins and miscellania); 2, Dacian products destined for trade; 3, communications by land and river; 4, merchants, and 5, the distribution of amphorae and local imitations of Graeco-Roman goods.

Glodariu includes some finds as evidence for trade when their provenance is far from certain. The black and red figure lekythoi from Barboşi may have formed part of a modern private collection although the author makes no mention of the questionable provenance of this important find. Glodariu is occasionally guilty of inconsistency as when he plausibly argues that the lack of any finds of imported amphorae in Transcarpathian Dacia reflects, not the absence of Greek trade in oil and wine, but rather the necessary transfer of these commodities to less fragile (and less durable) containers of wood or leather for the journey across the mountains. However, on the same page, Glodariu affirms that the actual distribution of amphorae does reflect the pattern of trade (p. 12). Chapter 4 is entitled 'Commercial routes and stations': a title which fails to convince since his evidence only substantiates the use of the Danube and its left bank tributaries for the Dacian trade and Glodariu presents no good evidence to support his assumption that the overland routes from the Aegean and Adriatic were used to any significant extent, even in the 1st century AD. The work does demonstrate the difficulty of examining the kingdom of Dacia without comparative material from south of the Danube. Glodariu also maintains that Roman merchants from the Eastern Adriatic and Italy were already supplanting the Greeks by the second half of the 2nd century BC, crossing into Transylvania from Western Oltenia and the Banat (p. 99). Yet, the absence of Italian amphorae (p. 15) and the dominance of Greek imports down to the very end of the 1st century AD (Plates 1 and 2; p. 99) clearly suggest that the Greeks did continue to maintain their hold on the Dacian trade. The substantial numbers of Roman Republican denarii found in Dacia, particularly in hoards of the 1st century BC, is equally no conclusive proof, as Glodariu maintains, that the Dacians had a monetary economy (cf. M. H. Crawford, *JRS*, 67, 1977: 117 f.).

The organisation of the corpus is not altogether satisfactory since the reader is forced to search laboriously through the site material for references to the plate illustrations. A separate index would have saved considerable tedium. Nevertheless, the corpus will be of lasting use to scholars interested in Dacia and trade with the barbarian world. The discussion, despite its limitations, is provocative and usefully emphasises the areas where future research will hopefully add significantly to our knowledge of the subject.

A. G. POULTER

SNODGRASS, A. M. *Archaeology and the rise of the Greek state: an inaugural lecture.* Cambridge, Cambridge University Press, 1977. 37 pp., 5 figs. 70p.

Professor Snodgrass, in his inaugural lecture at Cambridge, has begun a new inquiry into the Archaic period in Greece and the methods which archaeologists should adopt in order to continue advances in the field. He, rightly in my opinion, regrets the lack of evidence generated through scientific analysis of the remains of this period. He points out that other archaeological disciplines rely to a very great extent on science, largely as a result of necessity. In Classical Archaeology, however, the availability of textual evidence has tended to stifle attempts to apply more modern techniques. Fortunately, there are signs of a changing attitude to the field and these new, more modern techniques are beginning to be employed. Snodgrass's own contribution to this is an interpretation of the rise of the Greek city state, based on statistical analysis of population patterns and pottery in the late Geometric period. In the end, he returns to traditional monumental evidence to support his main thesis: that the beginnings of the Greek *polis* can be traced not to the building of a fortification wall, but rather the construction of a monumental temple.

Snodgrass's application of scientific techniques hence seems valid; the results of both the statistical and pottery analysis show an Athens with a huge increase in population in the LG period, with very close ties to the rest of Attica. These are certainly arguable points, though I would prefer to see more evidence of all sorts before wholly agreeing that there was an agricultural revolution which brought on this population explosion.

On the question of the genesis of the city state, Snodgrass claims that the number of monumental temples built to a patron deity during LG and among the populations of the villages and precincts making up, for example, Athens or Corinth, implies a centralised government. On the other hand, fortifications appear around sites with no claim to *polis* status, such as the island of Donousa. His theory is entirely reasonable and has the added attraction of being more consistent than the currently popular hypothesis. The only comment I would venture on the matter concerns a coin of Evagoras II of Cypriot Salamis depicting the goddess Aphrodite crowned with a fortification wall. Does this not imply that some later Greeks, at least, believed in a connection between the fortification wall and the *polis*? Of course, what the Cypriot Greeks thought may have little connection with the truth, but it does raise a question which should be examined further.

An important piece of evidence that would support Snodgrass's conclusion concerns the first monumental temple in Athens. If incontrovertible proof of its construction in this period could be found, then the case would be immeasurably strengthened. Snodgrass believes that the column bases discovered on the Acropolis could well be from a Geometric temple, but there is also evidence that they are of Mycenaean origin. I fear that this problem may never be resolved to everyone's satisfaction.

Nevertheless, Snodgrass's lecture is well worth reading. It points the way to an area of scholarship which I believe must be exploited to a greater extent in future.

B. DE GRAZIA

BOARDMAN, J. *Greek sculpture, the archaic period: a handbook.* London, Thames and Hudson, 1978. 252 pp., 271 pls. £5.50.

This new handbook maintains the high standard set by the author's earlier monographs in the same series on Archaic black figure and red figure pottery. Its subject is the development of the Greek sculptural tradition from simple beginnings in the Geometric age, through the 8th and 7th centuries when Oriental and Egyptian influences transformed a comparatively minor craft into a monumental art-form and culminating with the great achievements of the 6th century; on the threshold of the Classical Age, as Boardman writes, a revolution was effected which 'was neither sought nor achieved by any other ancient people and it determined the future development of all European art'.

It is a pity that sculpture from outside the Aegean area is omitted, especially the two series of Metopes from the sanctuary at the mouth of the river Sele near Paestum and the Metopes from Temple C at Selinus in Sicily; provincial they may be, but they do amplify the comparatively sparse record of temple relief, at least outside Delphi, during the period. However, the rigid format of the series would then have demanded the exclusion of something else and in this spare but enthusiastically written account there is nothing (save perhaps two unhelpful figures on pages 78 and 79) which this reviewer would readily have cut – certainly none of the excellent plates which include some very unusual items such as a sketch by Cyriac of Ancona of a Kouros on Delos (Plate 60), fragments from chryselephantine figures from Delphi – the feet amazingly accomplished (Plate 127) and an erotic relief from Kos (Plate 249). Perhaps the author is right to treat the Greek West with other peripheral areas in a further volume.

As it is, the book contains not only a clear, concise history of the various sculptural forms, for instance the male youth or Kouros and its female equivalent, the Kore, but also wise words about artistic development in general: 'It is easy to fall in with the assumption that the sculptors were deliberately striving after realistic effects. But you cannot consciously strive for a goal you do not recognise . . . Wholly representational art was neither understood nor sought by Archaic Greek artists.' Here a salutory reminder that Archaic Greek was, in its own way, as traditional a society as any other in antiquity, and had, for instance, little in common with 19th-century Paris of the salons. Where the Greek artist differed from others lay in his ability to absorb foreign influences, to mould them to his own purposes and to discover new ways of expressing old formulae.

A further insight – and a shock for the Romantic democrat – the great flowering of sculpture in 6th-century Athens was a direct result of the patronage of the tyrant Peisistratos and his sons; indeed Boardman even suggests that some of the Acropolis reliefs might have come from a secular building, a palace. (p. 153): 'Peisistratos had promoted himself to live beside the gods on the Acropolis . . . virtually as a second Herakles, protégé of Athena . . .' Herakles appears on a memorable pediment (Plate 194) introduced to Olympus, but the best sculptures of all from this phase are from the Archaic temple of Athena, pedimental sculptures conceived on a large scale in the round: Athena herself dominates a gigantomachy, throwing her power into the victory of order against chaos (Plate 199). The Greek Tyrants, for a brief moment, prefigured the Hellenistic monarchs.

It takes a student of the minor arts, like John Boardman, to realise the effect that much Archaic sculpture had on the contemporary onlooker . . . Certainly it was not chastely neo-classical although Thorvaldsen's restoration of figures from the pediments of the temple of Aphaia, Aegina, makes it

appear so. Rather, it would have been gay with colour and often reflecting the gleam of burnished bronze and gold. He describes the Siphnian treasury at Delphi, 'the high point of Archaic decorative sculpture' as 'a large and glittering casket' (p. 159). It must have been almost transcendently beautiful and the reviewer shares the author's enthusiasm.

There are no footnotes in the book, but there is a highly serviceable chapter by chapter bibliography at the end.

Presumably this survey was designed for the student, but reading it will be a refreshing experience even for those already familiar with the delights of pre-Classical Greek art. At £5.50 hardback (less in paper covers) it is amazingly good value and no visitor to Greece should omit to pack a copy in his luggage.

MARTIN HENIG

COLDSTREAM, J. N. and COLLEDGE, M. A. R. (*eds.*) *Greece and Italy in the Classical World. Acta of the XI International Congress of Classical Archaeology. London, 3–9 September 1978.* London, The National Organizing Committee, XI International Congress of Classical Archaeology, 1979. iv + 315 pp., 48 pls. £15.00.

International congresses provide an opportunity for scholars to meet and to exchange information; in London where time was limited and the offers of papers overwhelming, the decision was taken to divide the congress into three groups running concurrently. An exception was made only for a few 'important' papers and for the reports on international projects, and participants were doubtless consoled by the knowledge that they would be able to read the texts of lectures which they had, perforce, to miss in the *Acta*.

What has happened? The reader is offered a list of 'Full Members' of the Congress, Opening and Closing Addresses of fulsome compliments and an account of the receptions and tours arranged for participants, reading rather like those charming accounts of excursions and exhibitions in 19th-century county journals. Equally ephemeral are the pieces on the various projects such as the *Corpus Vasorum Antiquorum* and the *Tabula Imperii Romani* and the summaries of about 180 papers. Alas this was the 'unkindest cut', for although most of the papers given will doubtless appear in some form elsewhere, there is no getting away from the fact that the life-blood of the Congress has been drained away and that out of over 300 pages only 100, the 'plenary papers' are likely to retain any sort of value for long.

Professor Pallottino's lecture was concerned with protohistory; it is a workmanlike account which stresses continuity from the Bronze Age into the Iron Age and the essentially local nature of Italian cultures. Mycenaean contacts left an echo in native tradition, but the eastern elements which appear in northern Italy from the 9th century can be explained by trade with the Phoenicians and then by contact with the Greek colonies to the south.

A. L. F. Rivet provides a useful summary of recent work in Roman Britain, although it confirms the relative poverty of the province which has produced little of real significance to the classical archaeologist. However, work on the *coloniae* of Colchester and Gloucester, which demonstrates how the designs of their early buildings were influenced by pre-existing fortresses, deserved fuller exposition with the aid of plans.

The remaining four papers are, fortunately, all of the greatest interest. Professor Andronicos gives the first account in English of what must be the find of the century – the Tomb of Philip II (whoever has doubts, this reviewer has none) and two other Royal tombs at Vergina, ancient *Aigai*. The story is told with admirable lucidity, and illustrated with 30 photographs. There has been more since, but this will always be a contribution to treasure, the moment at which the excavator reveals a major discovery to the scholarly world. This excavation has transformed our knowledge of Macedonian culture and of Macedonian kingship at the very moment when it came to assume hegemony over the Greek world and of the many nations of the Near East.

Another Greek archaeologist, Professor Yalouris, writes about the beautiful and unusual temple of Apollo Epikourios at Bassai, which it now seems did not stand in splendid isolation but had a settlement around it. The north–south orientation of the temple is explained by the close association of Apollo with the (legendary) Hyperborean lands of the far north while the famous (but unfortunately destroyed) Corinthian capital which surmounted a solitary column at the back of the Cella is interpreted as part of an aniconic image of the god himself. Professor Kahil is also concerned with a primitive element in Greek religion. The cult of Artemis especially in Attica has a strongly chthonic aspect connected with Hekate who, at Brauron, is apparently associated with Iphigenia. Bears were of course associated with Artemis who seems to have been, in origin, a bear goddess and was certainly *Potnia Theron*: at Brauron little girls were dedicated to the goddess as *Arktoi*, wearing garments symbolising bears' pelts. During the ceremony they laid these aside, recalling Iphigenia's gesture at the moment

of sacrifice. However, the rites at Brauron were not grim ceremonies of death but rather designed to invoke the deity's blessing as a goddess of fecundity both in humankind and amongst animals. Both these papers remind us that we should look for local attributes in deities as much in Greek lands and Roman Italy as in Gaul (apropos of Professor Kahil's paper what about *Dea Artio* at Berne?) or Britain. The study of ancient religion is fraught with difficulty but with Lilly Kahil in charge of the *Lexicon Iconographicum Mythologiae Classicae* (see p. 141) we may rest assured that our understanding of Greek and Roman mythology will increase a thousand-fold over the next few years.

Finally Professor Ward-Perkins presents a most interesting and persuasively argued paper on the reasons why Roman art has been so neglected. In the first place the least original period in Roman art corresponds with the apogee of Roman letters (the age of Cicero) with the result that posterity has judged it from the attitudes of that age. Secondly, for Winckelmann and his followers, Roman art was valued only in so far as it preserved, in the form of copies, Greek masterpieces. Although much happened in the later 1st century and in the 2nd century when, as Ward-Perkins points out, the empire became a sort of commonwealth and influences were passing from west to east as well as from east to west, the subject remains shamefully neglected in our universities. Ward-Perkins's paper, however, clearly demonstrates that Roman art is a legitimate subject for study.

To sum up, the volume is a great disappointment because of the high hopes which it aroused but like an expensively packaged box of crystallised fruit, it does contain a few morsels of choice delicacy and delight.

MARTIN HENIG

ONIANS, John. *Art and thought in the Hellenistic age. The Greek world view, 350–50 B.C.* London, Thames and Hudson, 1979. 192 pp., 189 illus., 1 map. £10.50.

The conquests of Alexander the Great expanded the geographical and intellectual horizons of the Greeks or at least of those amongst them with the wealth and education to take advantage of the new opportunities: it needs to be stated that relatively few people were in any position to adopt a 'world view' and that the title of the study commits the author to an unashamedly elitist approach. Fortunately the author is not also simplistic; he marshals a large variety of opinions on art and society from the 4th century (before the Hellenistic age had properly come into being) until early Roman times and reveals not so much a single attitude to the world as a debate.

Plato's Atlantis, though modelled on the Persian Empire and the wealthy Athens of late classical times, was prophetic of the cosmopolitan Hellenistic world. But whereas Plato dreamed of the lost purity and innocence of early Athens, Aristotle and his pupil Theophrastus were more objective. Scientific advance meant that life was much pleasanter than it had been in the Heroic period, and instead of a belief in a lost ideal they substituted an evolutionary doctrine. Evolution, however, implies choice and as examples of such choices we may take the Stoic faith of Zeno with its belief that character (*Ethos*) is supremely important to man and contrast it with the Epicurean philosophy that events were ruled by chance or, in the sphere of art, set the Attic sculpture of Pergamum and works of High Tragedy against the writing of comedies and the creation of caricatures like Antiphilus's *Gryllus* or the statue of Aphrodite admiring her own buttocks on Plate 53.

Hellenistic artists realised that there was a difference between the art, architecture and literature produced for the few and what was suitable for a crowd. This may be seen, for instance, in the contrast between the high relief and easy intelligibility of the great frieze on the Altar of Zeus at Pergamum as compared with the delicacy and less obvious message of the small frieze. Contrasts in size, in themselves fascinated the Hellenistic Greeks. At one extreme the sculptor Chares created his Colossus at Rhodes; at the other Lysippus made a statuette to serve as a table ornament (Plate 123) with as much mastery as he produced a statue at full-scale (Plate 122). These choices were also exemplified in the argument on the rival merits of epic as practised by Apollonius and compared to a great river, and of the small-scale epigrams on small-scale themes of Meleager and Callimachus which were like a small spring or a jug of water. Space interested the Greeks as much as size and resulted in the remodelling of sanctuaries and of city centres on rational principles. Theories about optics and acoustics found their testing grounds in the theatre, that most characteristic of Hellenistic inventions.

However, John Onians does not let us forget that Greek art was rooted in history. The great frieze of the Altar of Zeus was inspired by the metopes and pediments of the Parthenon as firmly as the Attalid kings were inspired to turn Pergamum into the New Athens. Indeed the centaurs on the metopes are endowed with the same bestial expressions as the giants on the Hellenistic monument (Plates 85–90). The calmness and order of the human and the civilised, be it lapith or deity, is in contrast to the violence and lack of control of the subhuman, the barbarian. The art of the High Hellenistic period – and here we may also relate the 5th-century Nike of Paeonius of Mende at Olympia (Plate 146) with Pythocritus's Nike from Samothrace (Plate 148) – was in its way as scholarly and imitative as the eclectic statuary of Pasiteles and his circle in the 1st century BC.

The conclusion to this study is equally surprising though not equally acceptable. Here Dr Onians returns to the Atlantis myth, and finds in Rome which had retained the purity and moral purpose of primitive Athens, the true successor to a Greek world which 'soon moved from vanity to delusion'. Yet up until this point he has shown us little of either while, whatever Polybius thought, the Roman Republic was infested with greed, the abuse of power and rank philistinism. Neither the Greeks nor posterity had much reason to cherish the memories of Mummius, Sulla or Veres. We may be grateful to individual Romans, men like Cicero, for the preservation of copies but the vital spark was kept alight by Greeks. The Tower of the Winds in Athens (Plate 174) is a case in point but Onians might have cited the Inner Propylaea at Eleusis in the 1st century BC, the battle reliefs on the monument of the Julii and the arch at Orange early in the following century, and above all the continued production of sculpture in the workshops of Asia Minor which allowed the Hellenistic tradition to survive and to blaze forth again in the 2nd century AD under phil-hellene emperors. By themselves, save perhaps in architecture, the Romans invented nothing new.

There are few mistakes of any substance in the book. On page 14, Roman soldiers are said to be shown clothed and mounted when subduing barbarian adversaries in contrast to the Greeks who fought nude and on foot. But this theme first occurs in Athens at the start of the 4th century BC and in Roman provincial art it is confined to Auxiliary tombstones. For these a Hellenistic origin seems certain as it does when the theme emerges with a truly Hellenic exhuberance in state art, on Trajan's Column and the Great Trajanic Frieze. On page 24, Isis should of course be a goddess, even in Plato. Also the dead and dying Giant, Amazon, Persian and Gaul in Naples (see p. 81 and Plates 81–4) though assuredly adapted from Pergamene prototypes take their places amongst other such defeated barbarians in Roman period versions of the theme: I do not feel that the grouping is in any way original.

This is a difficult book to read not because the writing itself it obscure – on the contrary in a jargon-ridden world it is outstanding in the clarity of its writing – but because it deals with so many difficult and intractable ideas. It assumes on the part of the reader a thorough knowledge of chronology, and although superficially dressed up as a popular survey and thus lacking in references (unfortunate as far as original sources are concerned) much of the detail is new and thought-provoking. Indeed, although highly selective (and evidently published too late to contain an assessment of the Vergina tombs) it should stand the test of time as a standard work on the intellectual and artistic history of the Hellenistic Age. Few books about the Greeks have given me as much pleasure as this one, which deserves mention alongside Martin Robertson's monumental *History of Greek art*, albeit as a 'small jug' beside his 'great river'.

MARTIN HENIG

TANNER, A. *Die Latènegräber der Nordalpinen Schweiz*. Schriften des Seminars für Urgeschichte der Universität Bern, Heft 4. Zürich, Historisch-Archäologischer Verlag, 1979 ff. 16 fascicles announced, 35 Swiss Francs each.

The complete catalogue will consist of 16 fascicles which are being published in groups. They are intended to cover La Tène graves in the German-speaking cantons of Switzerland arranged as follows: No. 1, Graubünden/St. Gallen; 2, Thurgau/Schaffhausen; 3/4, Aargau/Zug; 5–8, Zürich; 9, Luzern/Solothurn; 10/11, Baselstadt/Baselland; 12–16, Bern. So far the reviewer has seen parts 1–12. Part 2 includes a brief preface and introduction to the series as a whole. The stated intention is to concentrate on those finds that have been hitherto poorly documented. 'In cases where good publications of cemeteries already exist, documentation of the finds will be brief and references will be made to the publications.' Inevitably this means that much of the material is rather scrappy and disappointing through lack of reliable associations and poor preservation. Even so, any comprehensive catalogue of finds is useful and these volumes will be welcomed by all La Tène scholars.

The general format of the series does, however, seem rather eccentric. Pages are of very thick paper, printed just on one side (not a few are completely blank on both sides). Even on printed pages, there tend to be large expanses of open space. Most objects are illustrated life size, although the draughtmanship does not always merit such a large scale, and nothing would have been lost by considerable reduction. And the arrangement of the illustrations in groups at the end of cantonal sections, away from the relevant text and location maps, makes the volumes rather awkward to use. More usual methods of organisation and printing could almost certainly have compressed the 16 volumes into just one or two without any very obvious loss in clarity, but with a considerable gain in convenience and cost. Nevertheless, the material is now published.

F. R. HODSON

BINTLIFF, John L. *Natural environment and human settlement in prehistoric Greece, based on original fieldwork.* (BAR Suppl Series 28). Oxford, British Archaeological Reports, 1977. 734 pp., maps and charts. £13.50.

Ever since the earliest application of Site Catchment Analysis to prehistoric settlements in 1969, a recurrent criticism of the model focused on a certain disregard for changes in the prehistoric landscape. At last, a student of the Cambridge school of locational prehistory has written a *magnum opus* demonstrating the impact and direction of environmental change on human settlement, generating, by implication, a powerful critique of studies assuming the opposite.

The lengthy twin volumes of BAR S-28 comprise an extended version of John Bintliff's PhD thesis. The work divides into two sections – 'Thematic and summary chapters' and 'Regional studies'. In the latter, the detailed results of the author's environmental fieldwork are integrated with site distributions produced by Aegean archaeologists. Eight areas are selected for study – south-west Argolid, the Plain of Argos, the Sparta valley, the Helos plain, Messenia, Melos, Mykonos and the Agiofarango gorge of southern Crete. These areas contain a balance of major Bronze Age centres and little-known (? because little surveyed) backwaters, enabling many fruitful comparisons of regional cultural change. In the first section, the author summarises the evidence for his reconstructions of past landscapes, discussing geology (including sea-level changes), geomorphology, vegetational history and soil studies. The three core chapters of the work follow, summarising economic, socio-political and ritual aspects of settlement.

In a study which attempts to explain the interaction of human occupation and natural ecosystems from the Palaeolithic to recent times, a tendency to period bias is unsurprising; the Mycenaean period is the natural candidate. This emphasis notwithstanding, the author shows fluency in classical archaeology; a tour de force is his analysis of the identification of the Menelaion with Helen and her consort (pp. 411 ff). But the most stimulating aspect of the work is the integration of environmental disciplines with the archaeological data in the best traditions of landscape study. Future workers will find of especial value the author's original environmental surveys, covering the soils of south-west Argolid and Mykonos, geomorphology and soils of the Sparta valley and soils and land use potential of the Agiofarango Gorge and Melos. A complementary but disturbing finding concerns previous geological or soil mapping in Greece not oriented towards archaeological studies; far too frequent were discoveries of sediments misidentified or misinterpreted, to the detriment of armchair settlement archaeologists..

Bintliff's theoretical basis exhibits a catholic style, eschewing false determinist dichotomies: 'The consistent and recurrent preferences exhibited ... [in settlement patterns] are to be traced to the determinism of human needs and the determinism of those fortuitous combinations of landscape features that can best satisfy those needs' (p. 628). The infinite variety of the Greek landscape offered a wide range of economic potential, yet the decision how far to exploit such potential rested on social and political factors, the relation of an individual site to other settlements. The canon of locational analysis – the consistent link between the settlement and its preferred resources – is maintained and amplified; it is argued that the location of every settlement unit is influenced primarily by its own subsistence base, despite rather than because of secondary factors such as trade, defence and communications. The interplay of subsistence and social factors acted as a serious constraint on the total area exploited by prehistoric populations within a given region.

The opening four chapters set the scene by scrutinising evidence for environmental change. It is here that Bintliff is most controversial, as he himself acknowledges in a later preface to the work. In the geology section, the author totally rejects the isostatic model of Pleistocene – Holocene sea-level change in favour of the eustatic viewpoint. Few specialists would assume such an extreme position, and it is noticeable that Bintliff glosses over the North European evidence supporting isostasy and the Messenian 14C dates inconsistent with eustasy. His geomorphology echoes Vita-Finzi's framework of two phases of sedimentation, except for the preferred Early Würm dating for the former. A curious anachronism in this section is the criticism of those who dissent from the Vita-Finzi scheme even though their works predate his (e.g. Van Effenterre, 1963; Eisma, 1964; Vinken, 1965).

Refreshingly, Bintliff queries the oft-heard assertion that the activities of man and his beasts contributed substantially to the recent degeneration of the Aegean landscape through soil erosion and deforestation. He argues that soil erosion adversely effects only upland areas and indeed benefits the lowland zone through the production of fertile soils. A further claim, that the lack of dense forest in Greek prehistory reflects geology and climate (especially the low rainfall of south-east Greece), is however vitiated by the author's own evidence. In most areas of south-east Greece rapid deforestation has occurred within the last two centuries and there is no evidence to suggest that such a climax forest vegetation did not exist in the Altithermal – indeed this is supported by the single pollen diagram from south-east Greece (lake Copais). In addition Bintliff overlooks the effects of prehistoric clearance on the sensitive balance between soil development, evapo-transpiration rate and the occurrence of

undergrowth. Caprines may not be the earliest Mediterranean villains – this role is surely reserved for the Neolithic farmer himself.

The author provides many stimulating insights into Aegean human settlement. In the first major attempt to explain the origins of Aegean civilisation since Professor Renfrew's *The Emergence of Civilisation,* Bintliff argues that Minoan and Mycenaean societies were based on the redistribution of local foodstuffs rather than commerce or mercenary service. Such redistribution was realised and channelled through a settlement hierarchy, itself based on the correlation (documented in Appendix A) of higher ranked sites with more fertile arable land. Two models are then discussed for the growth of successful farming and fishing economies into civilised communities. In the 'Sparta' model, extra productivity is seen as concentrating in lowland regions, which develop as core areas providing food and services for their upland hinterland. In the (not incompatible) 'Sacred Economy' model, Bintliff argues for wider cultural integration through increasingly standardised ritual behaviour. The well-known progression from worship at the local tholos or village hilltop shrine (EBA) to village and regional peak sanctuaries (MBA) is viewed as a combination of physical and spiritual hierarchies over ever-increasing territories. Such a parallel development of subsistence and ritual activities is more closely attested in Crete than in the mainland or the Cyclades. Whilst Mycenaean sanctuaries may yet be discovered, the militaristic aspects of competitive kingdoms in the Peloponnese are far from the weaponless, harmonious climax of Minoan palace civilisation. Indeed as Bintliff himself argues, the principal factor in the rise of Mycenae is not its arable but its central location in the (temporarily) united regions of Corinth and the Argolid. Off stage, ignored, stand the Homeric heroes whose social status is exhibited by luxury and exotica, not by the productivity of dependent farming communities. The limitation of social and economic comments to settlement aspects of the Mycenaean period is at once the strength and the weakness of Bintliff's thesis. One only has to realise the hitherto total lack of information on Bronze Age village life at Mycenae outside the palace to recognise the value of a subsistence-oriented approach in Mycenaean studies (cf. Mesopotamia, where the first excavation of an Uruk *village* site began less than a decade ago). A tendency to over-correct the inbalance of comment in favour of the commoners is almost inevitable. Yet the redistribution of local foodstuffs the author enthuses over is but one element in an intercontinental network of commerce, in which the leaders exploit discrepancies in resource availability in their own favour. Wheat may be a prestige crop in south-east Greece (p. 105) but the metal trade conferred far more prestige on its beneficiaries. If social behaviour comprises 'an exchange of goods, material and non-material' (Rowlands), the emergence of social hierarchies typified by political centres is a natural adaptation to ever-widening networks of Bronze Age exchange.

Adverse criticism of the work's minor failings may seem harsh in view of the many enlightened proposals. In a generally well-organised work it is curious to discover the chapter on Messenia so short and selective as to seem out of place. An unfortunate omission is the lack of detail on transhumance ancient and modern, a loss more deeply felt since comments on 'transmerance' are of some interest. Finally comparisons of Bronze Age population estimates with the 1928 Argolid Census (p. 697 ff) yield such a bad fit as to weaken rather than strengthen the case. Finally, printing errors are few and far between, and site name inconsistencies are rare (Francthi (p. 75) and Frangthi (pp. 116 and 121); Myconos (p. 951), Mykonos (p. 591) and Mukonos (p. 601). These minutiae apart, the author is to be warmly congratulated for this valuable contribution to Aegean studies.

J. C. CHAPMAN

CHRISTLEIN, Rainer. *Die Runde Berg bei Urach. III. Kleinfunde der frühgeschichtlichen Perioden aus den Plangrabungen 1967–1972* (Heidelberger Akademie der Wissenschaften Kommission für Alamannische Altentumskunde, Schriften 4). Sigmaringen, Jan Thorbeck Verlag, 1979. 43 pp., 26 pls., 1 plan. DM. 72.

The excavations at the Runde Berg in south-west Germany took place from 1967 to 1972 inspired by Vladimir Milojčić. Two volumes of report have already appeared, the first on small finds from the area of the site, the second, reviewed in the *Bulletin* (No. 16), on the wheel-thrown pottery from the excavations, and now we have a volume of small finds from the 'early-historic-period' produced from the excavations. The volume is dedicated to Milojčić who died suddenly in 1978, shortly after his 60th birthday.

The direct translation 'early-historic-period', although awkward in English, saves a lot of time and effort explaining that the site spreads over the later stages of the Roman period and the migration period. Even that description is misleading, for a site outside the Later Empire can hardly be called Roman. It would perhaps mean more in English to say that it is a Germanic site, and it would do many people who talk glibly about Germanic influence in Britain, and Germanic influence in Late

Roman art, a lot of good to browse through this volume. They need not read it, for much of the message would get through simply from the pictures.

The small finds are excellently set out in 26 plates of clear line drawings mostly at a scale of ¾ or ½, though for some finds which are very small such as the almandine or garnet only 2.5 mm long, the scale is 1:1. The catalogue gives a brief, clear, description of each object including its actual dimensions, the substance of which it is made, and usually a date. As the soil on the site averaged about 10–20 cm in depth there is no obvious stratigraphy; details of find-spot are therefore confined to 10 m grid squares shown on the foldout plan at the back of the book.

References to the more notable finds are included in the Commentary where footnotes give full directions to parallels and latest studies. It is tucked away in the commentary that we find reference to a possible church (grozed window-glass and a porphyry slab) and a useful discussion of the dating of the belt equipment and the glass. The buckles and belt-stiffeners, loops and strap-ends are a very interesting selection spreading from the middle of the 4th century up to at least 700. They take in the tail-end of Roman production, and go on to proper Germanic types, getting simpler, iron rather than bronze, and less demonstrably 'Germanic' as they go.

This is an excellent publication of an interesting site.

RICHARD REECE

BELTRAN LLORIS, Miguel. *Ceramica romana: tipologia y clasificacion* (Estudios 1). 2 vols. Zaragoza, Libros Pórtico, 1976. 234 pp., 97 pls. 950 psts.

This volume consists of one volume of text, and one volume of plates. The first, text, volume, is divided into three parts. The first is concerned with the general theory of Roman Ceramics – investigation, nomenclature, manufacture, economic implications, techniques, and a chapter on the processes involved in the actual manufacture of the vessels themselves. The second part is divided up into 17 chapters dealing with most types of fineware, from Precampanian ware (5th and 4th centuries BC), down until Palaeochristian stamped orange and grey ware (5th and 6th centuries AD), together with a chapter on amphorae and coarse pottery. The third, and in this case, the most important part of this volume is the extensive bibliography and indexes. The second, and far more valuable volume is a catalogue of 75 A4 plates, with 960 individual pot profiles mentioned in the text and index.

There has been extensive work on Roman ceramics in the Mediterranean in recent years, and not least in the Iberian Peninsula. A succession of works testify to this – Mesquiriz' monograph and related works on *Terra Sigillata Hispanica* (1960), Beltran Lloris, *Las Anforas Romanas de Espana* (1970), Vegas' *Ceramica Commun Romana Del Mediterraneo Occidental* (1973), and most recently, Mayet, *Les Ceramiques a parois fines dans la Peninsule Iberique* (1975) – to mention a few. Each of these was not concerned so much with the *status quo* of the type under consideration, as much as constructing typologies and amending the dating of individual forms. However, unlike these, this publication assumed the very ambitious and difficult approach of trying to look at every aspect of every branch of the subject in too summary a way. The quality inevitably suffers, and some areas are better treated than others, causing a patchy text that represents a *reasonably* exhaustive summary of conclusions from recent studies in Roman finewares.

Invariably the text preceding each of the sections on different types of pottery says little. The background to each is outlined, and followed by a breakdown of individual productions within a group, viz. in the chapter on Italian Sigillata, Arretine (plain and decorated), Pozzuoli, Tardo Italica and regional offshoots of Arezzo – all providing a deceptively neat picture of a complicated subject. When applicable, stamps typical to the production are listed according to Oxe and Comfort; some omissions in the references were disappointing, viz. C. Bemont, *EFDR*, 1976 on the S. Gaulish stamps from Glanum – Ventura Solsona, *MMAP*, IX/X, 1948/9 (1950), on the Sigillata stamps in the Museo Arqueologico de Tarragona. A selection of form numbers and correspondences with the plates are then listed (in fact repeating the full list, with dates, in the index – pp. 209 ff), followed by a distribution map of the different types within the Iberian Peninsula. While this rightly draws attention to good recent excavations at sites like *Conumbriga* (Portugal), *Sentroma* (Barcelona), *Pollentia* (Majorca), *Centcelles* (Tarragona – the reference to which was omitted in the Bibliography), etc., it seems a shame that some attempt at mapping quantitative distribution was not attempted.

A point perhaps worthy of notice, is that in the references to the chapter on Terra Sigillata Hispanica, the article by M. Del Amo on the very well recorded excavation of the cemetery at Pere Martell, Tarragona (*BA* 113/20), was omitted which together with reference to a Sigillata Hispanica mould on a site near Reus, point to the possibility of local production on the east coast of Spain, as well as the production centres mentioned (pp. 110 ff).

As one would expect, the most accomplished chapter is that on amphorae (pp. 167–78), where Beltran lists most amphorae according to their area of production – and including the new Lusitanian

form IVb. However, it is a little surprising to see the geographical confusion in listing Tunisian amphorae of the Africana I and II series as being produced in Tripolitania, together with the Almagro 52; the Spatheion coming from Mauretania is, to say the least, still uncertain. Beltran might also have assigned the Almagro 54 to its Palestinian origin, although unfortunately this was published in a journal (*BASOR*, 218, 1975) that is not as widely circulated in the Mediterranean as it could be.

One other point is that there are a series of bibliographical omissions, quoted references omitted in the bibliography (viz. the reference to Jacob, 1974: 132), small printing errors (viz. on p. 144, Moutinho A 1976, reads 1966 in the bibliography). These are only small points but add to a feeling of vague mistrust.

However, the strength of the publication lies in the plates and index, which provide a very wide catalogue of dated profiles, some of which would be otherwise very difficult to obtain (viz. Palol's work on *Terra Sigillata Hispanica Tardia* in *AAH*, 7) and which are very useful for quick reference on archaeological sites.

SIMON J. KEAY

PEARCE, Susan. *The Kingdom of Dumnonia: studies in history and tradition in south-western Britain, AD 350–1150.* Lodenck Press, 1978. v + 221 pp., 12 figs., 16 maps, 32 pls. £7.95.

To say that this book shows the south-west of Britain emerging from a Dark Age would be patronising and unkind, but partly true. Miss Pearce is basically a historian, so that the parts of this book which rest on written sources are better than those which rest on archaeology. Her preferences are fairly clear in that periods for which written records survive use archaeology mainly as a support while the centuries up to *c.* 650 often call in continental written sources to supplement the native archaeology.

On the historical chapters I can have little to say, for the author is far better versed in the texts than I am, and I found little in general to object to, and much to enjoy. She quotes widely from recent studies, and includes, for instance, Wendy Davies' work which has isolated from the Liber Landavensis a fascinating 'Celtic' type of charter with origins in Roman law of the late 4th or 5th centuries. Estates surviving from the 4th century to be given to Saxon minsters are accepted, and mention of 'urban villas' coming into being inside the wall (of Exeter) during the 4th century must earn from me a special mark of gratitude.

But on the archaeological side all is not well. I know that the 5th century is a time of Migration, but this is usually taken to be of people, not places; on the introductory map of Europe facing p. 7 Xanten must be put back on the Rhine, and Trier must vacate its position somewhere near the Belfort gap, and return northwards. 'Aliscamps' is not a place near Arles, Les Alyscamps is the cemetery area *of* Arles. Surely Viviers on the Rhone counts as a monastic site of the 5th century in Gaul (p. 14). The imported ware known as Class D cannot be Frankish, and is better called terre sigillée grise. 'North African wares' at Exeter are not closely enough defined; I think from the context they are North African amphorae though the terminology suggests that they are North African red slip wares. If they are amphorae, then they just cannot be closely dated at present between about 250 and 500. They are therefore not 5th century dating evidence in themselves. Points such as these do affect the credibility of the earlier part of the narrative, and similar points could be culled from later sections such as the now-exploded Irish Grass-Marked Invasion, but in so many ways Miss Pearce marks a great advance on what has gone before that it would be wrong to concentrate on the slips.

Many of Miss Pearce's slips are not her own, and to draw attention to them is really to castigate her sources. Charles Thomas' IG–MI is a very good case in point, for the author considers all the written sources carefully, uses circumspect phrases such as 'have been taken to suggest', and generally allows more doubt on the subject than is normal in Cornish circles. But her sources have been overtaken by events, the grass-marked pottery from 'apparently early levels' (note her use of *apparently*) on Iona has now evaporated; such pottery from further north has turned Viking, and is elsewhere undated, so the case has crumbled. She mentions the suggested connection between imported pottery and monastic foundations, but she also makes her own list of non-monastic sites, and the idea drops out of discussion as unlikely. She lists the classes of imported pottery first from Tintagel (classes A, B, and D) and then Gwithian (class E) but is almost guilty of over-omission when she tactfully fails to mention that Class C appears to be a normal Medieval jug type. This does affect the whole problem of Tintagel and its dating. Here again Miss Pearce is very good on recent developments for she gives us the standard picture of Tintagel, then mentions Ian Burrow's awkward questioning of that picture, and ends up out of sympathy with what one might call the Classical Cornish interpretation. To a foreigner she does not go far enough, for surely we must assume that the early site is so far unexcavated on the plateau, and the imported pottery incorporated in the 'monastic' huts is due solely to the dumping of earlier rubbish.

I have considerable respect for this attempt to knit together a picture of early Dumnonia from archaeological and historical sources because it forms a real attempt to get to an objective picture, rather than a legend embroidered with material evidence, and I very much hope that it will have a good sale so that a revised edition may appear in due course.

RICHARD REECE

RADUNCHEVA, Anna. *Prehistoric art in Bulgaria, from the fifth to the second millennium B.C.* Translated from the Russian by Caroline M. A. Schuck (BAR Suppl Series 13). Oxford, British Archaeological Reports, 1976. 54 pp., 102 pls. £2.70.

During much of the sixth to fourth millennia, south-eastern Europe provided the continent's most advanced proto-civilisation. In *Prehistoric art in Bulgaria* Anna Raduncheva offers a fascinating glimpse of the artistic heights reached by the Neolithic and Chalcolithic cultures involved, as well as, after their downfall, that of the Bronze Age, when the whole process had to re-start.

The extraordinary maturity of the pottery in the earliest Neolithic phase, the Kremikovtsi and Karanovo I cultures, is traced to western Anatolian traditions, carried by the first European farmers across the Eurasian isthmus, now the Bosphorus, to find new homes in the Thracian Plain and adjacent fertile lands. The examples illustrated are full of interest, but black and white cannot fully represent the decoration of the characteristic and noble 20–30 cm high tulip-shaped vases of the period.

The Late Neolithic Karanovo III culture, with stark monochrome pottery possessing different artistic values, comes as a shock and is associated with a new treatment of figurines. Raduncheva ascribes it to a large immigrant group with alien traditions. Thracian Plain tell settlements show that it covered a lengthy period, wholly displacing the earlier culture. It also vanished, although pottery similarities with the much later Early Bronze Age ware caused confusion when continuous layers were found in early, unstratified digs.

The major flowering came in the Chalcolithic period – the Karanovo VI or Gumelniţa culture. The graphite painted pottery, often with highly stylised decoration, the anthropomorphic figurines, both realistic and schematic, are evidence of a proto-civilisation that might have vied with those of the Near East had it not been cut down in its prime.

Modern Bulgaria is, of course, only part of this story, but an important part. Raduncheva, an experienced archaeologist who combines aesthetic appreciation, interest in the social and religious background of primitive art and admirable objectivity, provides an authoritative introduction to the subject. The translation, from Russian, conforms to BAR's high standards, but those pursuing the subject should be warned that, as in the German edition, the names of Bulgarian periodicals on page 42 appear, confusingly, in Russian.

R. F. HODDINOTT

STEVENSON, J. *The Catacombs: rediscovered monuments of early Christianity.* (Ancient Peoples and Places 91). London, Thames and Hudson, 1978. 179 pp., 35 figs., 109 pls. £7.50.

One of my rules on reviewing books is to review the book on its own terms rather than the terms which I think ought to have been employed; to review the book that has been written rather than the book that I think ought to have been written. Mr Stevenson's book on the Catacombs stretches this rule just about to the limit because there must come a time when author and reviewer must part company. This sounds as if fire and brimstone, to follow Stevenson's biblical language, were about to fall; not at all. It is simply the preamble to qualified approval followed by mildly revolting disagreement.

The book has chapters on the making of the Catacombs, mainly in Rome, their history in antiquity and their rediscovery, and a long section on the paintings, their derivation, iconography and meaning. A quick look at possible burial places of heretics and schismatics is followed by a quick summary of similar burial places in Sicily, Tunisia, Naples and Malta, and the book ends with a brief summary.

Stevenson's heart is given to the life and doctrine of the Early Church and the commentary furnished by the paintings of the Catacombs. As an excellent summary of this part of the subject the book can be accepted by all, but they will need some basic knowledge of Church doctrine, the early christian authors, Greek and Latin. It is not a book for complete beginners for inscriptions are not always translated, and some in Greek are, I think, rather misleadingly translated into roman capitals (e.g. EIRENE for EIPENE) in the text. It is also a firmly Protestant book, with the Bishop of Rome kept firmly as such, no doubt with good historical reason, and Mary allowed the title Virgin, but never Blessed.

What is missing, and Stevenson is not to blame here, is any hint of the archaeology of the Catacombs. If it is not Stevenson's fault, ought a review of his book to include dismay at the faults of others? Yes, for the subject is 'The Catacombs' and the archaeology of the Catacombs is at present sadly neglected. Stevenson often mentions the way in which the rubbish produced in the digging of new Catacombs is pushed into old and disused galleries. Wonderful, dating evidence galore. Except that those who clear the Catacombs have up to now regarded these deposits as rubbish and no such material has ever been published. Here is my disagreement; it revolts at the present stage of Christian archaeology as practised in Rome. But let us hope that the stratigraphic revolution will reach even the Church.

RICHARD REECE

LIVERSIDGE, J. *Everyday Life in the Roman Empire.* London, Batsford, 1976. 222 pp., 105 figs. £3.95.

This book sets out to present a picture of everyday life in the different Roman Provinces, a task which the author correctly regards with caution. It is covered in eight chapters, which deal with the development of towns; examples of towns; home life; education and recreation; industry and natural resources; country life; communications and trade; religion and burial. All of this is within a loose framework of the late 1st and 2nd centuries AD.

The challenge in attempting to write any book of this kind is two-fold. Firstly, within the confines of 222 pages, some aspects of the vast range of subject matter must be over-simplified or omitted. The question is, which ones? In this case, it could be argued that Liversidge is giving us a pedestrian's view of life in the Provinces – hence the preoccupation with domestic affairs and occupations, clothes and various outward aspects of religion. Consequently, little *incisive* attention has been paid to explaining how the Provinces worked, the role of the army (a subject which, despite its importance in the Romanisation of the provincials, the author almost totally avoids), and so on. Also, in trying to cover so large a spectrum the quality suffers in places; viz. in the case of the towns, after having described Augst in some detail the author goes on to describe differences in towns in Germany, Pannonia, the Eastern Provinces and North Africa. It is on such a general level that some of the more important differences are overlooked.

Secondly, the method used to investigate daily life is through a purely descriptive material survey of objects, buildings, etc., combined with superficial use of inscriptions and texts. Consequently, there seems to no real feeling for the people or their lives. In this respect, it seems a shame that Egypt and its illuminating papyri was a subject that was largely consciously avoided.

However, taking the book at face value, in providing 'some of the fascination of the subject', and in 'stimulating further study', to the general reader the book is worth reading. It possesses a good series of photographs and plans (some more of which could have been used with effect in the description in the section, p. 65, on the north-east quarter of Volubilis), adequate bibliography and two appendices.

SIMON J. KEAY

SMALL, Alastair (*ed.*) *Monte Irsi, Southern Italy: the Canadian excavations in the Iron Age and Roman sites, 1971–1972* (Bar Suppl Series 20). Oxford, British Archaeological Reports, 1977. 296 pp., 42 figs., 38 pls. £5.50.

This is a very detailed account of the excavation and finds from two sites, A and B, on Monte Irsi (Basilicata). Occupation of the sites covered the Early and later Iron Age (8th and 5th centuries BC) and the earlier Roman period (2nd century BC until 1st century AD) with some periods of abandonment. The Roman buildings were of various types, including one with an agricultural function, probably a cattle stall. There are long and detailed catalogues of the pottery, accompanied by drawings and photographs.

It is a pity that the quality of the photographs is not the best (possibly the publisher's fault), and that the plans of site A are so sketchy, particularly when compared with those of site B. The drawing of a burial from site B shows the arrangement of the grave goods very well.

R. J. Buck's description of the area as 'one agriculturally poor now, and apparently never much better' seems rather sweeping; it is slightly contradicted by E. M. Wightman's account of a nearby valley as 'surprisingly verdant even in summer'. I also feel that there should have been a French edition of the report, as well as an English one, rather than have part of the pottery report in French with an English parallel translation. As it is the rest of the report may be unaccessible to French readers.

Despite the above criticisms, the report is a readable, and detailed account of a short period in the history of Monte Irsi.

P. A. GREENWOOD

HÜLLE, Werner M. *Die Ilsenhöhle unter Burg Ranis/Thüringen: Eine paläolithische Jägerstation.* Stuttgart, New York, Gustav Fischer Verlag, 1977. xx + 203 pp., 17 pls., 327 figs. DM 160.

As early as 1965 the late Professor Charles McBurney (in Foster and Daniel, *Prehistoric and Early Wales,* pp. 27 *et seq.*) realised that the cave of Ilsenhöhle below the Castle of Ranis in Thuringia (German Democratic Republic) was potentially critical to the interpretation of the Early Upper Palaeolithic archaeology of Britain. To date in order to understand this site we have been dependent upon short summaries by its excavator in *Mitteldeutschland, Forsch. und Fortschr.,* Bd. II for 1935 and in Julius Andree's more general work *Dei eiszeitliche Mensch in Deutschland und seine Kulturen* (1939).

Excavated at the instigation of Dietrich von Breitenbuch from 1926 to 1939 the 7 m deep profile disclosed archaeological material ranging from Migration period to Earliest Upper Palaeolithic or even Mousterian, the Pleistocene deposits being protected by a Medieval dump from more recent disturbance or investigation by 19th century antiquaries. The final task of bringing to press an account of these excavations fell upon J. Hahn, and H. Müller-Beck, upon the sudden death of Werner M. Hülle in 1974.

The lowest level Ranis I (the lower brown layer XI) is believed to be Middle Palaeolithic but the presence of what could be interpreted as a leaf point ('Blattspitze') rather than a 'Faustkeilblatt' (Taf. I) together with regular blades (Taf. 2, nos. 3 and 4) may hint that this lowest layer belongs instead to an early central European leaf point industry, potentially as early as 40,000 radiocarbon years bc on the basis of earliest dates for Szeleta and Bohuniče.

Ranis 2 (levels IX and X: the 'middle brown' and 'grey layers') is of particular importance to us in Britain in that its stone industry contains a large series of 'leaf points' made on blades, the majority with retouch mainly concentrated upon their ventral faces. With these are some fully bifacially flaked pieces with markedly plano-convex profiles. All the leaf points are bipoints and the whole group bears an immediate resemblance – as recognised by Hülle (p. 121) – to the material from Nietoperzowa, near Cracow, where the leaf points of layer 6 are dated to 36,210 bc ± 1,250, Equally these leaf points resemble what would in the past have been termed in Britain 'Proto-Solutrean' points and which are now seen to be a part of the stone tool kit of our 'Earlier Upper Palaeolithic', being recognised from just over 20 open or rock-shelter sites.

While the bulk of the leaf points come from level X a few were found in the lower part of the overlying 'middle brown layer' and are separated only by the upper part of this layer from the rich stone industry of Ranis 3 (levels VII and VIII). This latter industry is quite clearly Aurignacian and several writers (Andree (1939) and Zotz (1951) *Altsteinzeitkunde Mitteleuropas*) have quite convincingly compared it to the contents of Vogelherd V. Notably absent from this assemblage are leaf points.

The observed succession, Aurignacian without leaf points overlying a blade industry with (many) leaf points must be immediately relevant to the interpretation of such potentially confused assemblages as those from Spy and Goyet in Belgium or Kent's Cavern and Paviland in Britain where the microstratigraphy which might have related the Aurignacian component of these collections to the leaf points recovered by the same excavators was not observed. It may strongly be suspected that at all four sites, as at Ilsenhöhle, Aurignacian type artefacts occurred rather higher in the profile than the leaf points and that the sterile bands between the two assemblages may likewise have been peculiarly thin.

Hülle places Ranis 2 and 3 within the same interstadial (Abb. 26). To the reviewer this appears a slightly doubtful interpretation if we are to accept the archaeological parallels which seem appropriate – Ranis 2 with Nietoperzowa and Ranis 3 with Vogelherd V. Nietoperzowa as we have already suggested is dated to close to 36,000 radiocarbon years bc and hence must fall within the Hengelo interstadial, while a series of radiocarbon determinations suggests a most probable position for Vogelherd V within either the 28th or 29th millennium bc (Hahn (1977) Aurignacien. . . p. 168), that is within perhaps the equivalent of the Arcy interstadial further to the west in Europe or the end of the cold phase which immediately precedes it, and succeeds Hengelo. Study of the sedimentology by Utescher (*Abhandlungen der Geologischen Landesanstalt,* Berlin, 215, pp. 1–15) would seem to confirm that the loamy layer IX might have been formed under milder conditions than either VIII or X which consisted instead of dolomitic residues formed *in situ* under glacial conditions.

It is difficult to know what significance to put upon a broken convex backed blade from level VII which would if encountered in France be described as a 'Châtelperron point', unless it is simply to confirm what has already become abundantly clear from other stratified sites and the radiocarbon dates at our disposal, namely that the earliest blades – including Châtelperron points – are in Western Europe innovated only rather later than the phase when blade industries with leaf points were current in Central Europe and are locally the contemporaries of the earliest Aurignacian. Ilsenhöhle is listed as a Châtelperronian site by Bordes (1977, p. 215, in Bordes (*ed.*), *The origin of Homo sapiens',* Paris, UNESCO).

Ranis is listed also by Hahn (1969, *Bonner Jahrbücher*, Bd. 169, Abb. 20) as a Gravettian site but the artefacts from Ranis 4 (level VI described by Hülle as Magdalenien) are really too few, with a total of 62, for cultural attribution and except for a complete Gravette point (Taf. 55, no. 273) and what could be the tip of another (Taf. 51, no. 228) and a series of distally truncated blades which could certainly be Gravettian there is little in the assemblage which could be considered diagnostic. From Ranis 5 (levels III to V) is an even smaller collection of artefacts which includes a 'Rechteck-messer' (Taf. 57 no. 287) identical to examples from Ölknitz and clearly indicative of a late Magdalenian use of the cave.

The text is clearly written, the diagrams clear and the photographs and drawings of the artefacts superb. As a report it is the model of how such volumes should be presented and congratulations are due to Joachim Hahn and Hansjürgen Müller-Beck for seeing through to completion the project so brilliantly initiated and undertaken by Werner M. Hülle in the 1930s and continued up to his death. Of all the sites so far published from Germany the Ilsenhöhle bei Ranis must surely be that with the greatest relevance to our own upper palaeolithic studies.

R. M. JACOBI

TANNER, Alexander. *Die Römischen Kastelle: Brücken zwischen Kelten und Alemannen: Ein Beitrag zu Fragen der Beseillungskontinuität.* Zurich, Historisch-Archäologischer Verlag, 1978. 276 pp., 103 figs., 10 maps. Sw.Fr. 38.

This book seems to me to be a minefield for the foreign reviewer. And yet it was sent for review, so, treading carefully, duty must be done.

It is intended as a summary of material so that a wide readership may feel the fascination of the Kelts, the Romans and the Alemanni. The title suggests that the main emphasis is to be with the late Roman fortifications in northern Switzerland, and indeed pp. 121–224 are taken up by a gazetteer of these sites, but the book also has a message to give, that these Castella are temporal bridges from the Kelts to the Alemanni.

This approach is unusual, and I automatically have great sympathy with any writer who tries to demonstrate the way in which periods of national history, divided by chronological labels, and by the experts who study them, can be seen to move smoothly over boundary lines previously thought impassable. But bridges are not there for the describing, they have to be built: in this part of the exercise I think the author has failed. For instance we have the section headed 'Die keltische Religion lebte weiter', and, together with mention of the Imperial Cult, there are Keltic or rather Romano-Keltic temples, and dedications to gods of mixed origins such as Mars Caturix. But all this concerns the High Roman age, and nothing has previously been said about Keltic, pre-Roman religion, so continuity is far from proved.

At the other end of the time-span the Alemanni, who have appeared in the sections on 'The decline of Rome', 'The threat from outside', and 'The Alemannic invasions', cross the now geographical bridges in 401 to take over as heirs to the 'proud Kelts'. The invasions of AD 260, and after, are unquestionable because the many coin-hoards buried between 260 and 280 'sprechen eine zu deutliche Sprache' (p. 78). This language is not so clear to me, and is so unclear to at least one fellow Swiss that the whole connection between coin-hoards and invasions at this period has recently been questioned. There are connections, then, between Romano-Kelts and Alemanni, but the newcomers arrive in the material record with no material introduction, and their only illustration is a superb plate of fully developed jewellery of the 6th century from Zurich. Where were they before this? Do they really appear from nowhere, materially speaking, after a century of gestation?

The answer may well lie in the entries of the gazetteer. For instance at Zurzach we have two churches which might properly be described as Late Roman. There is the earlier one built up against the walls of the Castellum, and that must belong to the very end of the 4th century, or the years immediately after 400, and, on the north bank of the Rhein, virtually in Barbaricum, is the church of St Verena of the 5th to 6th centuries and her supposed grave, presumably of the 4th century. This does suggest continuity, and deserves further examination.

In the entry for Kaiseraugst we are given some useful summary plans of the Castellum and the church, but we are left with a fairly standard summary of the sequence of occupation from Late Roman fort, through a break, into a later Christian settlement. We are also given a reference to band 5 of the *Archäologie der Schweiz, Die römische Epoche,* and if we follow that to the excellent article by Max Martin, *Die Zeit um 400,* Abb. 6 and 7, we see from the cemetery evidence that Alemmanic material is already appearing in graves of the 4th century. It looks as if it is going to be progressively more difficult to keep separate those inside and outside the Late Empire, but the necessary bridges will only be built, as in this case, by meticulous excavation and detailed analysis of material, especially from cemeteries.

I have perhaps been rather severe in my criticisms of the book, but this follows from the ambitious plan which the author set out, and then failed to carry through. On the positive side it has stimulated my interest in this area and given me the means of following this interest further.

RICHARD REECE

SIEVEKING, Ann. *The cave artists* (Ancient Peoples and Places 93). London, Thames and Hudson, 1979. 221 pp., 32 figs., 6 maps, 1 table, 115 pls. £7.50.

This well-informed and enjoyable book covers the field of Upper Palaeolithic cave art in Europe. Ann Sieveking's approach is to discuss the art from many angles – the history of its study, the various hypotheses concerning its meanings and *raisons d'être,* the associated archaeology and comparable mobile art. Chapters deal with decorated rock shelters and with geographical groupings of decorated caves.

Sieveking sums up our knowledge of this art by saying we know little more than its uniformity, duration, location and content, and suggests that religious motivation might be postulated. She concludes:

> 'It is very probable that we shall never know the meaning of Palaeolithic art for, although the naturalistic element is potentially comprehensible, the idiomatic and schematic are not. They are simply a language for which we have no vocabulary' (p. 209).

On the way to this modest conclusion, she produces a very interesting analysis of a good number of decorated caves in the central Pyrenees, the Pays Basque and Cantabria. This is the 'black outline' group, the 'formula' for which is as follows: bison and horse pictures are the basic theme together with numerically unusual animals, claviform signs and phantom human representations; similarity of execution and layout of black outline paintings in panels deep within caves; very formalised methods of shading; some animals headless or placed vertically; and the decorations are dated by style if not by direct material evidence to Magdalenian IV. Caves in the Périgord or in the 'Mediterranean' group do not conform to this pattern.

'Style' is continually used in her discussions and, although she recognises limitations of the method, particularly its unavoidable subjectivity, she holds that 'when trying to establish the chronology of Palaeolithic art stylistic comparisons remain the most reliable guide' (p. 32).

In all this, André Leroi-Gourhan is – rightly – given much credit. However, it seems to me to be a misreading on Mrs Sieveking's part when she says: 'Leroi-Gourhan's work on Palaeolithic art has been accepted less critically abroad than it has been in England, . . .' (p. 64). As well as numerous published critical allusions to Leroi-Gourhan's work, the sigh of relief on the Continent that greeted Ucko and Rosenfeld's rationalist treatise on the subject in 1967 could hardly be missed.

I fear that Mrs Sieveking has accepted a few things a little too uncritically. Among them, that certain brace- and shield-shaped signs at La Pasiega and El Castillo may be convincingly derived from the human vulva (p. 177); that so-called 'Venus' figures should 'belong clearly to a cult' (p. 78) *pace* Ucko (1965; part 5, chs 1–2); and that 'a bird with a fish in its mouth' (p. 145) is represented at Montespan despite the fact that it is now not generally accepted as such.

The illustrations are numerous, well chosen and well produced on the whole (with the frustrating exception, in particular, of Figs 10 and 11, which are several times compared stylistically in the text although the reproduction of the photographs makes the comparison difficult), and make a worthy complement to a stimulating exposition.

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ALEX HOOPER

VALLET, G. (*ed.*) *Méthodes classiques et méthodes formelles dans l'étude des amphores romaines* (Actes du Colloque de Rome, 27–29 mai 1974) (Collection de l'Ecole Française de Rome, 32). Rome Ecole Française de Rome, 1977. 318 pp. illus.

This volume contains a series of papers attempting to clarify the problems of definition and classification in Roman amphorae. It is encouraging to find that at last a need has been felt to examine the question, although disconcerting that the papers show such a broad difference of opinion between the traditionalists (and the '*études* classiques') and the innovators (with their 'études formelles').

Indeed except one, all the contributors can be divided into one of these two 'camps' of irreconcilable opinion. Among the former can be counted Ettlinger (Aspects of amphora typology seen from the north), Parker (Lusitanian amphorae), Pascual Guasch (Las Anforas de Layetania), Beltran Lloris (... Aportaciones a la tipologia de las anforas beticas), Lusuardi Siena (Appunti su alcuni tipi di anfore lunensi). The above shy away from the more exact mathematical models of description advocated by the innovators, doubting its common applicability to the study of amphorae and possibly its relevance.

The innovators include Hamon and Hesnard (Problèmes de documentation et de description relatifs à un corpus d'amphores romaines), Panella and Fano (Le Anfore con anse bifide conservate a Pompeii: Contributo ad una loro classificazione), Farinas del Cerro, De la Vega and Hesnard (Contribution à l'etablissement d'une typologie des amphores dites 2–4), Tchernia and Villa (Note sur le materiel recuelli dans la fouille d'un atelier d'amphores à Velaux), Guenoche and Tchernia (Essai de construction d'un modèle descriptif des amphores Dr. 20). The above see problems of gross subjectivity marring our proper understanding of amphorae and ancient economics through the arbitrary creation of new types of subdivisions. Hence they advocate (in most cases) models of mathematical description, which if taken seriously, seem to isolate new types, confirm older ones, or else get hopelessly bogged down in their own complexity.

One drawback with the mathematical models is that except in the case of purely theoretical examples (viz. Hamon and Hesnard), they have all been applied to groups of early and complete vessels. Thus they are used with effect on Dr. 20, and Dr. 2–4, and could perhaps be profitably used on the Dr. 1 family since in all these cases, a large number of complete vessels are known, and because we know both brackets of their production period.

To the vast majority of Roman amphorae, however, these are impossible requirements to meet. For instance, amphorae of the later period present a complicated panorama of many types which are only known to us as rims, stamps, or other unclassifiable fragments, and lack the benefit of finer stratigraphy to clarify subdivisions – hence having an impossibly wide 'production period' (viz. Beltran Lloris, *Las Anforas Romanas de Espana*, 1970 – types 59 ff). On Mediterranean excavations (viz. Michigan excavations at Carthage), figures show that even these rims and handles (of well known types, viz. the Africana I, II series, as well as other questionable 'types') are in small proportion compared to the vast majority of featureless body sherds which usually account for an overwhelmingly higher proportion of amphora fragments. As these consistently occur in far greater proportion, then it follows that whatever method is used to characterise, describe or separate different productions must in some way take these into account, otherwise our economic 'trends' will be based on too limited a sample.

This said, there remains the paper by Peacock (Roman amphorae; typology fabric and origins) which seems to have gone sadly unnoticed in the 'Interventions' at the end of the book. Petrological study of amphorae fabrics is not a panacaea to cure all ills but must be taken seriously as part of a solution to the above problem as well as bridging the differences of opinion between the traditionalists and innovators. Most contributors have gone to pains to stress the colour of the fabric or the importance of its study, etc., without every understanding the complexities of what they were describing, hence invalidating in several cases grouping on this basis. Thin sectioning, heavy mineral analysis, etc., advocated by Peacock are one of the few methods actually involving the 'stuff' of the amphora, and that despite its general limitations, fabric study as a basis for grouping should perhaps be taken more seriously.

In a different sense the papers by Beltran Lloris, Pascual Guasch, Tchernia and Villa and Parker, are also important since they offer a panorama of material from kiln sites. This has helped to define more clearly some of the problems about the confusing typology of the S. Spanish Garum amphorae, and the S. Gaulish Dr. 28, and to raise others concerning the difficulties of the Dr. 2–4 (Pseudo-Koan) amphora, which can now be documented as being produced in S. Spain (Guadaranque), Valencia (Oliva), Catalonia (Barcelona and Tarragona), S. France (viz. Velaux) and central Italy (viz. Terracina). Variations on these forms do exist (thus the paper by Farrinas del Cerro and others, on their mathematical form characterisation, where the type is subdivided into C1 – Campanian, C2 – Tarraconensian, C3 – Italian, C4 – Velaux), and fabric study might also seem a useful approach, since a lot of the vessels are unstamped.

Generally speaking one of the strong points of the publication is the quantity and quality of illustrations – profiles, black and white photographs, and 12 colour photomacrographs. They provide a very useful body of comparative material, although predominantly for the first two centuries AD. Secondly, it provides a very encouraging comment on the progress of amphora studies in the Mediterranean, coming two years (although published 3 years after the actual conference) after the publication of the earlier, 'Recherches sur les Amphores Romaines' [E.F. de Rome, 1972, Coll. 10].

SIMON J. KEAY

ROSSITER, J. J. *Roman farm buildings in Italy* (BAR Int. Series 52). Oxford, British Archaeological Reports, 1978. viii + 81 pp., 15 figs., 2 maps, 2 pls. £2.00.

Rossiter introduces his work with the just claim that villa studies in Italy have passed through phases of popularity. His book is a product of the latest vogue but is, perhaps, a little premature. This past year has seen the publication of two important villa reports, a lengthy paper on Republican villas of the *Ager Cosanus,* one interim on the villa at Sette Finestre and Potter's book on *The changing landscape of South Etruria* (1979), all directly relevant, but all missing inclusion in Rossiter's work. Additionally, the spate of current projects – excavations at Sette Finestre, Via Gabina, Anguillara and in the areas of Pompeii and Aquileia, and survey work in the *Ager Cosanus, Ager Falernus,* the Molise and Liri valleys, etc. – is yielding much relevant information.

However, none of this is constructive criticism. Rossiter's aim was restricted solely to 'a consideration of the architecture, and specifically the lay-out, of Roman farm buildings and their various facilities' (p. 2). In this he succeeds, by drawing together many of the Italian sites which by nature of their respective published reports are amenable to further interpretation and comparison.

Chapter I is devoted to small farmsteads and reviews the scanty evidence for modest buildings which are likely to have been low on the social ladder. Monte Forco in Etruria is certainly one of the simplest rural buildings known. Interest in such sites is all too often lacking, thus over-emphasising the apparent predominance of the more complex *atrium* type villas. The recent Rice University excavations at Via Gabina have revealed a similarly simple structure as phase 1 of what was later to become a fully-articulated Imperial farm.[1] However, the earliest Gabina structure apparently dates to the 3rd century BC, whilst Monte Forco appears to have been of the late 1st century BC, whether related to Caesar's land allotments of 46 BC or not. The post-holes shown in Rossiter's plan, incidentally, do not belong to the original plan but to a later phase.[2] Other sites, like Posta Crusta and Sambuco are shown to be similar to Greek dwellings such as those known from Olynthus. Much will undoubtedly be learnt from detailed studies of land utilisation around the Magna-Graecian sites in Southern Italy, but possible Etruscan/Italic contributions to Roman farm planning must not be overlooked. Similarly, the influence of urban design should be continually stressed. The 4th/3rd century BC House of the Surgeon at Pompeii,[3] for example, has much in common with the later villas based on an *atrium* (cf. the farm at Tolve Moltone, p. 8, fig. 3C; p. 22 and refs.). The interrelationship between country and town-house plans needs further elucidation as although farms are technically centres of an agricultural holding, they need not be solely confined to the open country. Villages might be seen as an agglomeration of farms, whilst farms could well be situated in town fringe areas. One such site, occupying part of the same hill as the colony of Cosa, included a row of olive or grape presses amongst its facilities. Wacher and Rivet[4] also remind us that farms (but not *villae,* by definition) might also be situated within towns.

The statement (p. 5) that 'the size and quality of the buildings no doubt reflect the economic return of the farms and, accordingly, the area of the land holdings associated with them' is a rather simplistic generalisation. For example, tenant farmers would not necessarily have wanted to invest an amount proportionate to the profit from *their* land in a farm building that was not theirs. Absentee landowners may not have wished to have spent more than was necessary for the functioning of their estate on their farm, whilst small, apparently autonomous, farm buildings might represent no more than subsidiary outbuildings of a larger villa.

Chapter II, 'Farm and House', deals with the more luxurious farms. A classic example, discussed in the book, is the villa at Boscoreale Pisanella, which was totally destroyed after the war to make way for an orchard. This site yielded the famous Boscoreale silver hoard. Rossiter, following Crova, notes its similarity in design to the villa at Boscoreale Giuliana (p. 18), which he suggests may have been due to a local architectural tradition or imitation by one of the other. Might they not both have been the work of a single architect, as has been suggested for the three villas with turreted perimeter walls in the *Ager Cosanus*? These Boscoreale sites break out of the mould of the 'typical' *atrium* type villas. Another such building, recently published but poorly excavated, lay near Fidenae to the north of Rome.[5] it displays an unusual plan of two main rectangular blocks set on axes which differ by no more than 7°. Three walls radiating out from the major angles of the complex, which do not appear to form proper enclosures, may have been intended to delineate functional sectors of the farm or to assist in the movement of livestock. The pretensions of the Boscoreale Pisanella villa suggest that one should not seek social differentiation between *atrium* type and 'Boscoreale type' villas.

The third chapter, with the somewhat innapropriate title of 'Rural Villas', aims to survey farms which were fragmented into separate functional units. This is a difficult task unless one can be certain that the whole villa complex has been recognised. The three villas of San Rocco, Russi (which has recently been fully published and includes an up-to-date plan[6]) and of 'Publius Fannius Sinistor' are used as examples where the *villa urbana* has a separate nucleus to the working farm. Whether such a distinction between these villas and examples such as Camarelle is valid, remains to be seen. The other sites discussed in this section seem to be even more fragmented in that they display 'a number of

independent buildings spread over a wide area'. Unfortunately no fully excavated sites of this last category exist and their true nature is often far farm clear.[7]

The chapter on 'Slavery and Farms' illustrates a number of sites which may reasonably be supposed to have comprised slave accommodation within their architectural framework. The villa at Gragnano and that of 'Tiberius Claudius Eutychus' seem to have had *cellae* placed around large courts. The example *par excellence* of this feature may be seen at the villa of the Volusii, just to the north-east of Rome. The site is discussed by Rossiter and the report has just been published.[8] The *cellae* were arranged around two or three sides of a large colonnaded court, with the fourth side comprising an internal façade of the *villa urbana*. Other *cellae* appear to have fronted on to a small paved courtyard behind the main villa façade. The complex could have accommodated, at least, some 50 slaves. Similar *cellae*, situated to one side of the villa at Sette Finestre,[9] may have held some 32 slaves. None the less, as Rossiter points out, the archaeological evidence for *cellas familiae* (Cato, XIV, 2) on Roman estates is scanty and therefore we must, for the time being, rely largely on the agricultural writers. We have seen how *ergastuli* (Columella, *De re rustica*, 1, 6, 3) are, as yet, unknown in Italy (p. 47, note 3; although a convincing structure was found at Chalk, Kent[10]), which leads one to suspect that they were far from being the rule. Such underground constructions may have been viewed as an unnecessary expenditure when strong *cellae* would have been equally secure. As slave quarters are difficult to detect archaeologically it may be that they have gone undetected on a number of sites. What, for example, could one make of rooms 11 to 14 at Boscoreale Giuliana (p. 19, Fig. 5B)?

The two following chapters deal with press rooms, and granaries, storerooms and cattle sheds. A considerable number of presses are now attested archaeologically, both in Italy and abroad. Little of use can be added to Rossiter's survey, although many other Italian examples could be quoted, and this is not the place to discuss their mechanics. The four presses discovered at Sette Finestre,[11] during the 1978 season, are however interesting for various reasons. Apart from their well-preserved state (even down to the lead still surviving in place in the *foramina* of the *lapis pedicinis*), they indicate that identical lever and drum presses were probably used for both the olive and the grape. The two groups (three and one respectively) were situated apart, as with oil amphorae, the olive-presses would have been particularly difficult to cleanse. The Sette Finestre presses appear to have fallen into disuse after the end of the 1st century AD, at the time when much Italian produce seems to have disappeared from the Mediterranean market. Rossiter notes a platform press from Pompeii (p. 53, note 5) which is interesting in connection with the performance of agricultural activities within towns.

In the discussion of granaries only two, at Russi and at Vicovaro, are identifiable with some certainty. Three further possible examples may be mentioned. If the enclosure at the villa at Boscoreale Pisanella is to be seen as a threshing-floor (p. 19, Fig. 5A, 20) then it should follow that room 19, which is labelled a barn, was wholly or in part a granary. Quilici also argues that room H2 of the farm at Castel Giubileo (near Fidenae)[12] should be similarly interpreted on the basis of an interior dividing wall which could support a well-ventilated upper storey. This seems unlikely, especially as the room was centrally placed within the main farm building, in a most inconvenient position for the bulk storage of grain. An interesting late Republican structure in *opus incertum* was discovered at Acireale is Sicily.[13] In plan it consisted of a rectangular block some 40 m long by 14 m wide with eight small internal walls projecting some 2 m from the building's main sides. The structure may be interpreted as a large granary of barn perhaps pertaining to a large estate, and in this connection the presence of fragmentary *dolia* is significant. Other such structures, including stables as at Gragnano, Licinico, Monte Irsi and Posto, must have formed an integral part of all farms. The limited number known can only be due to the difficulty of recognising functional units which, within limits, were not subject to standardised forms. One may hope that with the excavation of new Pompeian villas where organic material is often preserved *in situ*, together with more precise excavation techniques, a greater understanding of the diverse functional areas embodied in each farming complex will be achieved.

The concluding chapter skates through the chronology of Italian farm architecture. Dating is often difficult and until area surveys, supplemented by excavations become the rule, general dated trends cannot seriously be inferred. With the recent upsurge of interest in *instrumentum domesticum*, signalled by studies such as John Hayes' *Late Roman pottery* (1972), there is also little excuse for site dating having to rely upon building plans, architectural features or stylistic analyses of wall paintings and mosaics. However, one of the most significant trends which is now being revealed seems to have been the abandonment of sites around the turn of the 2nd century AD.[14] Even though many such sites have produced evidence for later activity on a limited scale, information is rapidly accumulating to support the hypothesis of an Italian economic upheaval during the Principate. Whatever the various reasons, which cannot be simply stated, land-usage in 4th century Italy appears to have been radically different to that of the late Republic and early Empire.

One of the main criticisms of the book under review must be that with the increasing accumulation of material in all aspects of the study of ancient cultures, a subject such as farm architecture can not longer be treated separately, but rather its various manifestations should be seen against a backdrop of continuously changing socio-economic situations. Other criticisms are less serious, and the volume

is undeniably a valuable source for newcomers to the study of the Italian landscape, and an introduction to the Italian rural architecture of the Roman supremacy.

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PAUL ARTHUR

KENYON, K. M. *The Bible and recent archaeology.* London, British Museum Publications, 1978. 105 pp., 104 figs., pls. £5.50 (cased); £3.25 (paper).

We can be grateful to the late Dame Kathleen Kenyon for making accessible to the lay public a view of post-war developments in Biblical archaeology. The volume, which has received notice elsewhere (J. F. Ross, *PEQ,* 1979: 134–5), is based on a series of four lectures (1976), and contain little mention of controversial archaeological issues. Basically, this lucid text represents an updated version (from an archaeologist's perspective) of her father's *The Bible and archaeology* (1940) as is stated by the author (p. 6).

Conveniently beginning with a précis of some generally accepted critical approaches to Biblical literature (p. 7), Dame Kathleen sets an archaeological background to various books of the Bible mainly from the vantage point of ancient Palestine. Most chapters are prefaced with comments on major problems of interpreting Biblical texts, and the reader is led from the period of the Patriarchal narratives (Genesis) through the time of the Hebrew Kingdoms (e.g. Kings and Chronicles) via the Israelite 'entry and settlement' (Exodus and Joshua). The closing chapter (6) provides cohesion by presenting a concise picture of the archaeological setting of Roman Palestine.

Dr Kenyon's interpretations stem from her long service in the field (e.g. Jericho and Jerusalem) and at the desk (e.g. Megiddo and Ugarit) on major sites in the Levant. She gives full credit to Père de Vaux's *Histoire Ancienne d'Israël* (1971) on which she draws heavily as a source of textual reference.

This excellently illustrated and very readable volume affords a convenient résumé of Dr Kenyon's widely published interpretations and much discussed views on archaeology of Biblical periods. It seems rather surprising, however, that a book avowedly aimed at a general readership should include a bibliography composed largely of site reports; this coupled with the dearth of extra-Biblical literary sources could easily be balanced by reference to K. A. Kitchen's *The Bible in its world*... (1977). A broader-based introduction to Biblical archaeology, complementing the work under review, might be P. R. S. Moorey's *Biblical lands* (1975).

M. O'D. SHEA

KENYON, K. M. *Archaeology in the Holy Land,* 4th edn. London, Benn, 1979. xxii + 368 pp., 88 figs., 96 pls. £9.95.

This recent issue takes into account many of the more outstanding archaeological discoveries made in Cis- and Trans-Jordan during the past two decades. No less significant are the syntheses reappraising earlier excavations of major importance (e.g. Megiddo and Beth-shan) and the résumés of recently excavated sites (e.g. Bab edh-Dhra' and Arad), information on which is sprinkled throughout the literature.

The volume displays an expanded and, for the most part, improved series of illustrations, although there are notable exceptions (e.g. Figs 73 and 88). The updated appendix of 'excavated sites' (with reports) has been enlarged, and is presently complemented by a selection of recently published general studies. As readers have come to expect, the text and illustrations are both conveniently cross-referenced, and metric notation has been added. However, a chronological chart, which would seem an essential for a book of this nature, does not appear. Little tillage is required to use the notes which now close each chapter.

There have been noticeable alterations to this now standard text. In the main, and especially for the early chapters, Dr Kenyon has fully integrated into the text, usually in modified form, the 'revision and addenda' section of the 3rd edition (1970). New passages are presented as well, mainly qualifying (e.g. p. 5, on the Natufians, 'There is not, however, any clear evidence of the domestication of animals') or elucidating (e.g. p. 32 '... The ancestor of einkorn is to be found to the north, in Anatolia and north Syria, suggesting that Pre-Pottery Neolithic B people had northern connections') what was previously stated. In certain cases, elements (e.g. the Karim Shahir/Jarmo/Hassuna complex) have been supplanted by fresh information (e.g. Neolithic of the northern Levant), which is closer to home and adds considerably to the subject-matter presented by the author. Many chapters (e.g. III, V, and VIII–XII) have not only undergone similar revision, but reassess archaeological research on important earlier excavations (e.g. of the Solomonic and Omri/Ahab periods) as well as sites which have been re-excavated and published during the last 20 years (e.g. Teleilat Ghassul and et-Tell). Chapters V and IX, on the Early Bronze and Early Iron Ages respectively, show healthy revision, at least in part.

Although Dr Kenyon maintains her fundamental theme, that successive waves of new groups invade Palestine and usher in new periods in its history, important qualifications are apparent throughout the text. For instance, while retaining her Intermediate Early Bronze–Middle Bronze (here abridged: EB–MB) scenario for Palestine, she now sees a fully urban character for northern Syria (e.g. Hama J) during this period. However, considering the many studies published concerning, for example, the Middle Bronze Age (Chapter VII), the minimal revision is somewhat disappointing. None the less, the Late Bronze Age (Chapter VIII) has received thorough rewriting, based mainly on her own ceramic analysis (e.g. *Levant,* I, 1969: 25–60, and *CAH,* II, 1971: xi) which is in turn set against the rather exclusive background of the Amarna Letters. The section on the Hebrew kingdoms (Chapters X–XII) is liberally peppered with brief summaries of recent excavations (e.g. Jerusalem and Tell ed-Duweir) west of the Jordan; the former, mostly dealing with h. -work, offers a tantalising glimpse of things to come.

Serious typographical errors have crept in (e.g. p. 64 '... Safadi 360 BC ± 350 ...' and p. 191 '... Mycenaean III A to III A12 vessels...'; and while at first glance Figs 1 and 5 are a welcome addition, the captions do not seem to fit the site distributions). It should also be noted that two different chronological schemes are used: the high chronology for the prehistoric periods, and the middle chronology for historic times. Nevertheless, this fourth and final edition clearly surpasses its predecessors in both style and content, and represents a truly revised version of the original (1960). Dr Kenyon states her case with clarity and conviction, adding or subtracting information where she feels the evidence demands. The author's synoptic but authoritative interpretations of the archaeology of ancient Palestine fit snugly into their geographical niche, neatly posed between the northern perspective of Charles Burney's *From village to Empire* ... (1977) and the eastern vista of C. L. Redman's *The rise of civilisation* ... (1978).

For the student (as well as the scholar), this publication presents as up-to-date a synopsis as is possible with a work of this kind, providing a very reliable guide to the archaeological history (*c.* 9000–330 BC) of the pre-Hellenistic Holy Land. A complementary volume, supplementing the ancient literary sources for the book under review, would be *Israelite and Judaean history,* J. H. Hayes and J. M. Miller (*eds*), 1977.

M. O'D. SHEA

WARD, William A. *Studies on scarab seals, Vol. 1: Pre-12th Dynasty scarab amulets.* Warminster, Aris & Phillips, 1978. ix + 116 pp., 16 pls, 52 figs. £15.00.

This is largely a pioneer work in that, as the author remarks, 'there exists at present no reliable system for dating scarabs accurately.' Concerning the early period covered in the first volume he adds

that 'the difficulties are even more acute', for most of the examples are uninscribed design scarabs, and designs are particularly hazardous as dating evidence. In order to make full use of what criteria exist Professor Ward considers, as others have often failed to do, all features of the scarab: design, back, head, side, material, etc., basing his study on 220 scarabs from dated contexts with a further 171 examples which relate to these stylistically. The former group is mainly from Middle Egyptian sites (Qau el-Kebir, Mostagedda, Matmar) and the Fayum area (Sedment, Gurob, Harageh). More controversially he includes in the 'dated' series 68 examples found by Montet in a jar at Byblos, on a study of which Ward collaborated with Miss O. Tufnell (*Syria*, **43**, 1966: 165 ff), and for which he admits that 'scholars have in general been reluctant to accept our pre-Twelfth Dynasty date', the apparent one being somewhat later. Since his declared aim in the present volume was 'to find independent evidence, if such existed, that the Montet jar scarabs are indeed pre-Twelfth Dynasty in date', the inclusion of these as 'dated' criteria is odd. Presumably they were added after the author was satisfied about their date, which he considers to be Eleventh Dynasty (see also *Berytus*, **26**, 1978: 37 ff). It seems, however, to this reviewer that the objections to the later date preferred by some scholars might be resolved if the Byblos scarabs were not Egyptian but local products combining current trends with features which were by that time out-moded in Egypt.

For the general reader the Byblos scarabs may be of less concern than the study of the Egyptian pre-Twelfth Dynasty examples which is Ward's outstanding contribution. No previous publication has presented so fully the provenanced and dated material from the Old Kingdom onwards nor classified it so minutely. The book is amply and well illustrated, and includes a useful Appendix by S. I. Bishara on the biology and identification of scarab beetles. Only two volumes are planned, the second, by Miss O. Tufnell, continuing the project to the beginning of the New Kingdom.

H. M. STEWART

DEUEL, Leo. *Memoirs of Heinrich Schliemann: A documentary portrait drawn from his autobiographical writings, letters, and excavation reports.* London, Hutchinson, 1978. x + 405 pp., 28 figs, 39 illus., 31 pls. £10.00.

The outlandish figure who appeared at Hisarlık in 1870, John the Baptist-like, with one set of clothes and a diet of tortoises, and who dreamt at night of coffins and telegrams and bankruptcy, has fascinated biographers not least because of the wealth of published and unpublished papers he left behind. Deuel has had the happy idea of reproducing excerpts from Schliemann's writings, in chronological order, and of bridging the gaps between them with biographical sketches. The whole is prefaced by an introductory essay of 18 pages, and is followed by notes, references, a select bibliography, and a fairly comprehensive index. The text is embellished with attractive illustrations, many of which are contemporary engravings or photographs.

Deuel's understanding of this complex man is, I think, in amost every respect the right one. The two, standard views of Schliemann, represented chiefly by Emil Ludwig and Ernst Meyer, have been that he was either a treasure-seeker or, at heart, a life-long devotee of archaeology. By steering a course between these, Deuel provides a balanced, impartial and rounded picture of Schliemann's character and achievements. He correctly highlights the points in Schliemann's autobiographies where his talent for self-dramatisation has led him to misrepresent the facts of his life; and, conversely, he deals fairly with his natural interest in ancient gold. He sets him in his 19th century context, as a man with the typical obsessions and preconceptions of the era. He rightly concludes, too, that as an archaeologist he was considerably worse than his contemporaries. Unfortunately, however, he falls for the old cliché that his faults were also his virtues: that but for his enthusiasm Troy, Mycenae, Orchomenos and Tiryns would have remained unexcavated. With such obvious sites (and Schliemann was by no means the first to look at Hisarlık) this is hardly a plausible argument. Other sites, such as Knossos, Boğazköy and Qadesh, narrowly escaped his attentions, and here we are grateful for large mercies. In fact Schliemann's greatest talent lay not in archaeology, but in his unsurpassed manipulation of the 19th century publicity-machine.

I think Deuel is right to imply that Schliemann was largely motivated by the need for recognition, but he underestimates the extent to which he was affected by Homer. Schliemann had an obsessional need to bring to life the world of Homer, either by the spade or, when that failed, in a fantasy-world of his own. The homeric poems cut deep into his emotions. There are fruitful areas here for psychological exploration, which Deuel has not much investigated.

The linking biographical sketches are well done. They give a good picture of Schliemann's developing character and interests, as well as providing the necessary backbone to the book. The selection of extracts is judicious, and includes some less accessible items such as parts of *La Chine et la Japon* (1867).

Among the extracts are some translated by Deuel himself, and it is here that the main criticism of the book must fall. Despite Deuel's assurance (p. 356) that all cuts are indicated, the 'translation' of Schliemann's letter of 20th February 1842 in Chapter II would be better described as a sort of English digest. To take one example:

Briefwechsel, I: 13: 'Nachdem ich ein frugales Mittagsmahl eingenommen und dem Fk. die accordirten 4Rt. bezahlt hatte, ging ich aus, um einige Empfehlungsbriefe, die ich von Hückstädt zugesandt erhalten, zu verabreichen'.

Translation in Deuel: 'After I had a frugal lunch, I started out to present various letters of recommendation' (p. 39).

There are some instances of plain, bad translation. For example, p. 41: 'an der Winde' (at the winch) – 'in the warehouse'; p. 43: 'wurden die Anker gelichtet' – 'we lit anchor'; p. 51: 'Mein durch mehrere Pflaster entstelltes Gesicht sagte ihnen schon, wer ich sei' – 'My face, disfigured from adhesive tape, I announced who I was'.

The translations from *Ithaka, der Peloponnes und Troja* in Chapter VI are not much more reliable, although they have not been subjected to such heavy editing. I cannot find Deuel's translation (mentioned on p. 359) of *Ithaka,* pp. v–vi. On p. 132 the opening three paragraphs are an unexplained, gymnastic conflation of *Ithaka,* pp. xiv, 1 and 7, with *Ilios,* p. 18. The gesture (on p. 370, n. 1) towards providing an *apparatus criticus* to this is not only inadequate by wholly misleading, as the supposed addition in *Ilios* was in any case originally present in *Ithaka,* p. xiv. Examining the top half of p. 133 alone, I noted the following errors in translation:

'Then I steadily advanced along the [*omits* little] river; 'Waschplatz' translated as 'wash troughs'; 'bezeichnet als' translated as 'assigns to'; 'for Odysseus landed' should be in the present tense; the omission after '. . .along the seashore' is not marked; the passage 'But the princess . . . awakens Odysseus' is all a quotation from *Odyssey* Book VI and should be marked accordingly, and translated with an eye on the Greek; 'camped' is an inappropriate rendering of 'gelagert' in this context; 'bushes near the [*omits* mouth of the] stream'; 'identity of *that* river' makes nonsense – read *this,* as in the German; 'that one is [*adds* some] 12 kilometres . . .'; 'Cressida Brisis [why not Brusis or brysis?] is [*adds* within] three kilometres'; 'led in ancient times from [*omits* the old] town'.

It is disquieting to find the text so heavily peppered with small mistakes. Then in Chapters VI and VII Deuel has unfortunately reproduced unaltered Dora Schmitz's inadequate translation of *Trojanische Alterthümer in Troy and its remains.* The translations should have been revised. Even the proof-reading errors of *TR* have been reproduced: e.g. p. 201 (cf. *T. Alt.,* p. 241 f) 'we got the fire under' is surely an error for 'we got the fire under control'.

At some points Deuel's archaeological knowledge lets him down slightly, but it is perhaps not his primary field and he has obviously gone to some effort to acquaint himself with it. On p. 166 he has misunderstood Schliemann's aims in 1871 and, on p. 289, the stratigraphic changes of 1882. On p. 364 n. 17 several Hittite names are misspelt.

The stated aim of the book (p. 2), to let Schliemann speak for himself, is perhaps a little pretentious when we consider that Schliemann has been doing just that, quite volubly, for over a century; and when we remember that almost all of the extracts have been previously published elsewhere, if only in the original. Such an aim is not furthered, either, by the poor quality of the translations. To scholars and serious students it cannot, therefore, be recommended as a source-book, although the biographical treatment is good and deserves attention. But it is engagingly written and attractively put together, and it will form a graceful addition to many bedside tables. Overall it gives a good, general portrait of the man.

D. F. EASTON

KOCHAVI, Moshe, and BECK, Pirhiya. *Aphek–Antipatris 1972–1973: Preliminary report.* Tel Aviv, 1976. 86 pp., illus. n.p.

The site of Ras el-'Ain, lying close to the source of the Yarkon river in Palestine, has been identified as ancient Aphek and as the Antipatris of the Roman period. It was first substantially investigated in the 1920s by J. Ory, on behalf of the Department of Antiquities of Palestine, and two rather brief reports appeared in that Department's Quarterly in 1936 and 1938. Ory recognised the existence of Early and Middle Bronze Age occupation, as well as that of the Hellenistic, Roman and Byzantine periods. However, architecturally, the seasons were disappointing and the two city walls which Ory attributed to the Early and Middle Bronze Ages cannot be so ascribed with stratigraphic justification. The major contribution was the discovery of a series of graves of unusual construction, having rectangular pits, lined with stones, roofed over with large slabs, and containing pottery of the MBIIA period. It can fairly be said that the publication of these tombs and their contents was instrumental in elucidating and indeed defining this hitherto rather shadowy cultural phase in terms of its distinctive ceramic attributes. Later work by A. Eitan in 1961 at the foot of the south-east slope of

the mound, revealed the remains of a Roman mausoleum. He also corrected Ory's misconception that there had been a gap in occupation during the latter part of the second millennium BC and early part of the first, by the publication of material from these phases. However, it is the MBIIA material from Ras el-'Ain that has always been seen, justifiably, as being of great importance. Despite the comparatively large body of information concerning this phase which has been steadily accumulating since the work of Ory, architectural data has remained unforthcoming. Leaving aside the vexed and largely futile debates over the earliest occurrences of 'rampart fortifications' in Palestine, only Megiddo and Tell Beit Mirsim provided building remains of any significance, and even there, they consisted of rather poorly constructed domestic complexes. When the present series of excavations at Ras el-'Ain began in 1972, it was to be hoped, therefore, that this site, with its promising group of built graves would help to fill a serious gap in our information. The report of the first two seasons first appeared in the journal *Tel Aviv*, **2**, (1), 1975, and a report of the pottery from these seasons came out in the following issue of the same journal. The volume under review is a straight coupling of these two articles under a single cover, a very sensible idea since it makes this important report available to non-subscribers. No excuse is made, and rightly so, for concentrating on the Middle Bronze Age remains, and although Kochavi, in the first section, devoted to the architecture, summarises the results from the other phases, Beck's pottery section deals solely with the Middle Bronze Age. Kochavi's report is clear and concise and is well provided with plans. To his credit, there are also three sections, which, although somewhat inadequate, do illustrate the phasing discussed in the text. Two major areas provided remains of the Middle Bronze Age, and specifically the MBIIA period. On the north-west side of the mound, in Area A, seven strata belonging to this period were distinguished, the first three (VII–V) providing very few architectural features. The earliest, however, contained an important burial cut into the underlying EBIII stratum. Stratum IV produced evidence for a structure of monumental proportions, comprising lime-plastered courtyards bounded by walls of carefully laid, large, hammer-dressed stones. Kochavi describes the building as a palace, which seems a little premature. More recent reports have, however, confirmed it as a public building of some importance. The three 'Post-Palace' strata saw a reversion to private dwellings on the site of the 'Palace', are are remarkable only for their large number of sub-floor infant burials. Area B, on the north side of the Tell, was intended as a trench through the fortifications. Eight strata were isolated, of which IV, V and VI belong to the Middle Bronze Age. The lowest, VIII, revealed the remains of an EBI construction, which may be part of a city wall. Stratum VI is said to date to the MBIIA period and shows a stage in the city's history when it was an unwalled settlement. Stratum V produced the remains of a 2.5–3.00 m wide city wall, built of mud-brick on stone foundations: this was replaced by a new structure, on the same line, in the following stratum, IV. According to Kochavi, both of these structures also fall into the MBIIA period and certainly, the pottery published by Beck from strata V and VI, is typical of that period. However, an examination of the floor loci from which the pottery was derived, reveals that in all but one case, the floor levels, which are said to be associated with the walls are cut through by a Byzantine robber trench, running parallel to the walls, which destroys any possible relationships. The one floor level (locus 327), which is said to clearly run up to the earlier wall, is not marked on any of the published sections. In view of this lack of supporting evidence, it would be as well to be cautious in attributing these walls to the MBIIA period, particularly as it would make Ras el-'Ain the only known Palestinian site to possess a city wall at this date. Stratum III was very much destroyed by the above-mentioned robber trench, defined as stratum II, but seems to contain the remains of another later, but undated defensive system. The top stratum, I, defining the still standing Ottoman fort, is not discussed in this report, and only passing mention is made of the mosque found inside it, where the excavation area was designated 'X'. Two other areas, C and D, are briefly reported, the former, located in the centre of the mound, produced a sequence through Byzantine to Hellenistic, whilst the latter, in the South, revealed the basement of a large Byzantine public building. Kochavi concludes his part of the volume with a résumé of the sequence of occupation at Ras el-'Ain, pointing out the absence of EBIV/MBI material and the poor nature of the MBIIB-C phase. Whether this latter turns out to be merely a function of the limited exposure so far investigated, or whether there really is a recession during the later Middle Bronze Age, is an intriguing question, and one which further excavation should help to answer. For, if Kochavi is right, Ras el-'Ain would be an exception to the rule, for it is in the MBIIB period that the majority of Palestinian sites constructed rampart-style fortifications to protect their rather extensive settlements.

Beck's study of the Middle Bronze Age pottery is even more restrictive than the title suggests, for she only discusses the MBIIA pottery from Area A, even though she illustrates some examples from B. The tabular presentation of the technical details is clear and straightforward: it is easy to match up the pottery with the loci of Kochavi's plans. It is a fairly large but not particularly extensive corpus and, inevitably, the best and most interesting pieces comes from the tombs. She divides her study into the three main phases of Area A, Pre-Palace (VII–V), Palace (IV) and Post-Palace (represented only by II), and attempts to discern a developmental sequence over the period. A substantially larger sample is really needed, however, for such a sequential typological analysis to carry any weight,

and although Beck draws several conclusions, these are best treated cautiously until the material from the later seasons can be added to substantiate them.

Taken together, this is a useful book to have, and whilst the results are not exactly spectacular, they do again reveal the potential of Ras el-'Ain to provide much needed information concerning the early second millennium BC. The final report is something to look forward to.

JONATHAN N. TUBB

KOCHAVI, M., RAINEY, A. F., SINGER, I., GIVEON, R. and DEMSKY, A. *Aphek–Antipatris, 1974–1977: The inscriptions.* Tel Aviv, 1978. n.p.

This collection of epigraphic material should not be seen as a companion volume to the preliminary report reviewed above. This book covers inscriptions found between 1974 and 1977 at Ras el-'Ain, and they do not derive from the areas dealt with in that report. Again, the volume is a compilation of articles, six in all, reprinted from various numbers of the journal *Tel-Aviv*, and now brought together under a single cover. Kochavi has prefaced the book with a chapter describing the find-spots of the inscriptions. A brief mention was made in the preliminary excavation report, reviewed above, of Area X, which lay inside the Ottoman fort and where the remains of a Turkish mosque was found in the 1973 season. In 1974, further excavation, adjacent to the mosque, revealed substantial architecture belonging to the Late Bronze Age, and by the end of the 1977 season, a large area of an acropolis complex, dating to the 13th century BC, had been cleared. It was in the destruction level of one of the buildings of this complex (building 1104) that most of the inscriptions derive. Altogether, six cuneiform tablet fragments, five of which are published here, part of a Hittite bulla, an Egyptian finger ring and an Egyptian foundation tablet were found. The articles, written by the scholars listed at the heading of this review, are competently done and provide careful analyses and discussions. It has to be said that there is nothing particularly exciting and had the inscriptions not been found in Palestine, it is doubtful whether they would have warranted more than a footnote. Of the five cuneiform fragments published here two are of little value, bearing but one sign each. Another is part of an administrative docket giving a list of quantities: unfortunately, the commodities being quantified are not preserved. The most interesting fragment is from a trilingual text of five lines, bearing first a Sumerian word, followed by its Akkadian equivalent and finally by a form of the same word in a West Semitic dialect, related closely to Hebrew and Ugaritic. The Hittite bulla fragment is discussed at length by Singer, who dates it to the Empire period. Only a third of the object has been found, enough to show that it consisted of a central field surrounded by an ornamental frame of three rings composed of Hittite signs. The central field, which bore the owner's name, is so fragmentary that no identification is possible. Two Egyptian objects came also from area X, although the stratigraphic contexts are not clear, and they seem to derive from levels later than the 13th century BC acropolis. A faience finger ring bears the inscription 'Amon-Re, abundant in every favour, praise and joy'. The other hieroglyphic inscription is a small foundation tablet with the cartouche of Ramesses II, the type of object that may have been intended for a temple. However, as Giveon points out, the goddess, to whom the inscription is dedicated, is in this case Isis, who had very few temples prior to the Ptolemaic period in Egypt, and therefore, the occurrence of such a foundation deposit at Aphek seems very unusual. It is more likely that the object was brought to the site as a keepsake or curio. Also included in this volume is an ostracon, found at the Iron I site of 'Isbet Ṣarṭah, which was investigated by Kochavi during the Ras el-'Ain excavations as a part of the survey of the general area. The ostracon, of 83 letters, has as its fifth line an abecedary, above which are four lines of letters which cannot be formed into any meaningful sense. Kochavi suggests that it may be interpreted as a school-boy's attempt to copy the letters of the fifth line, a suggestion which seems very plausible. Kochavi dates the ostracon, on palaeographic grounds, to the 12th century BC, and it is, therefore, one of the earliest documents in the corpus of proto-Canaanite inscriptions.

Altogether, this is a moderately interesting collection of 'odds and ends' from Ras el-'Ain, but, apart, from the 'Izbet Ṣarṭah ostracon, which is important, is not one that is likely to advance by much the frontiers of epigraphy.

JONATHAN N. TUBB

AVI-YONAH, M. and STERN, E. (*eds*). *Encyclopedia of archaeological excavations in the Holy Land.* Jerusalem and London, Massada Press and Oxford University Press, 1977. Vol. III, 278 pp., illus. £11.50; 1976. Vol. IV, 302 pp., illus. £8.25.

It would be flattering, indeed, to think that the great improvements to be found in volumes III and IV of this encyclopedia were made as a direct consequence of this reviewer's reaction to and

comments of the previous two volumes (*Bull Inst Archaeol Univ London*, **14**, 1977: 225). Although this is regrettably doubtful, it cannot be denied that the quality of these final two parts of the four-volume set is very much higher than the earlier two. Many of the faults affecting volumes I and II have been rectified, for example, the inadequate bibliographies and poor balance of the articles. There seem to be many more contributions and the inclusion of small and more obscure sites renders the encyclopedia far more appealing to the professional archaeologist/ancient historian. Even the tendency criticised before, that of substituting modern Hebrew or supposedly ancient names, many of the latter being dubiously derived, for the well-established Arabic ones, seems to have been moderated. Thus, Tell esh-Shari'a is used to entitle the article dealing with this site, in preference to 'Tel Sera', which appears in smaller print beneath. Having previously grumbled at the absence of Tell el-Far'a (S) from volume II, it would be unfair to complain about its appearance as 'Sharuhen' in volume IV. However, the opportunity cannot be missed to point out that its new title has not been wholeheartedly accepted, for, although the article is entitled 'Tel' Sharuhen, the subsequent page headings refer to 'Tell' Sharuhen!

As to the articles themselves, volume III would be well worth buying if it contained nothing other than the very fine entry by Aharoni and Yadin on Megiddo. This really is the best summary of the site available and, despite both of the authors' personal involvements with the site, it remains remarkably objective. Thus, Aharoni, who deals with strata XX–VIIB, lays out in some detail Kenyon's arguments for her dating of the stratum XV temples and afterwards sets out his own counter-arguments which are then backed up with the results of more recent excavation. It is also refreshing to find the Chicago excavators credited with some degree of intelligence. For, despite the many criticisms, some justified, that have, over the years, been levelled at the Chicago excavations, it has to be said that Megiddo remains one of the basic frames of reference for work carried out in Palestine. The wealth of scholarly revisions, corrections and re-phasings that have been applied to the results would not have been possible had they not been quickly, efficiently and well published: this latter is difficult to say about the majority of other excavated Palestinian sites. One of the chief virtues of these two volumes is the inclusion of sites whose excavated results have otherwise appeared only in brief notices, some in Hebrew only. For example, volume III contains the most extensive report available anywhere for Tel Malhata, an important Middle Bronze Age strategic site on the eastern edge of the plain of Beersheba. The same, unfortunately, cannot be said for Gophna's contribution on Tel Poleg. This site crops up again and again in discussions of the MBIIA period, and yet there is virtually nothing published about it, save for a short article in Hebrew only (*Eretz-Israel*, **11**, 1973: 111–19). An extensive article in this encyclopedia would, therefore, have been both appropriate and welcome: disappointingly, Gophna has managed but one page! To be especially commended in volume IV is Negev's excellent article on Petra which provides a very clear presentation of the excavated results, and includes a concise exposition of Domaszewski's classic division of the tomb façades into seven styles. He then summarises the various arguments that have been put forward to separate these on chronological grounds, and only then produces his own, somewhat controversial, theory which sees the stylistic variation as a function of sociological rather than chronological difference. This contribution is also noteworthy for its remarkably comprehensive bibliography. Surprisingly disappointing is Wright's entry on Shechem, which is poorly written and muddled. It takes the form of a rambling essay in which reflections on biblical narratives concerning the site are allowed to interrupt the text and interfere with the sequential description of Shechem's occupational history. It is also surely misleading to illustrate a fenestrated axe-head (not the 'duck-bill' variety) as a typical find of the MBIIA period. Without doubting the type's occasional occurrence in deposits of this date, it is far from typical, and is more commonly associated with the preceding EBIV/MBI period. Volume IV has a general introductory article on synagogues by Avi-Yonah, the editor of the series, and it includes a brief listing and description of those sites not discussed in separate entries. This rather emphasises the fact that this contribution would have been better placed at the beginning of volume I. Nevertheless, it forms a good introduction for those who would like to acquire at least a passing knowledge of this field.

The standard of illustrations throughout these two volumes is very high indeed, with only the minor reservation that the plans, well drawn though they are, could have done with more descriptive labelling. The presentation and layout of the text with regard to the pictures has also been thoughtfully executed.

In conclusion, taking all four volumes into account, this encyclopedia has been, on the whole, a successful venture. As with any publication of this sort, there are bound to be weak points and the coverage will never be uniformly comprehensive. In the case of this series, any such failings are more than compensated for by the reliably accurate and generally up-to-date nature of the content. It is to be hoped that supplementary volumes will be planned to cope with more recent information from currently excavated sites and of course new excavations.

JONATHAN N. TUBB

JAMES, T. G. H. (*ed.*). *An introduction to Ancient Egypt.* London, British Museum Publications, 1979. 286 pp., 21 colour plates, 101 figs. £8.50 (cased), £4.95 (paper).

This volume supersedes the *General introductory guide to the Egyptian collections in the British Museum*, 3rd edition, 1964, of which it is in fact a revised version with new illustrations. The change of title is due to a reassessment of the book's character, which has been broader in scope than that of a guide or catalogue, being concerned with the physical, historical and cultural background of the collections. For those requiring further details of the exhibits there is the continuing series of monographs on separate categories, although the full accomplishment of that project seems still fairly distant.

There are obvious difficulties in basing a general work on a single collection. The main problem, that the range of examples may be inadequate, fortunately does not arise here. Another, more pertinent one, however, is that, having embarked on a broad treatment without reference in the title to the British Museum, the restriction of examples to that collection may seem unnecessary. A simple remedy would have been to mention their source in a subtitle.

Anyone who already has the admirable third edition may wonder whether it is worth acquiring the latest one also. For the general reader, to whom it is addressed, the difference in the texts may seem slight. However, the great virtue of this book in all its editions has been its usefulness for reference, and a version which takes account of recent research in chronology, etc., is most welcome. The translations of Egyptian texts have also been revised, a short bibliography of works in English has been added, and note has been taken of some rearrangement of the exhibits. A further bonus is the greater number of illustrations – still only about half as many as in the second edition of 1930, but the days when one got 460 pages for two shillings and sixpence have regrettably gone. Many of the new plates are, however, in colour, which is of good quality. The monochrome examples are less satisfactory, being too light in tone, and often trimmed rather precariously to fit the page. It is good to see that the selected list of royal cartouches has been retained, a most useful feature.

H. M. STEWART

TUCCI, G. *et al. La Citta' Bruciata del Deserto Salato* (*The burnt city in the Salt desert*). Italian and English text. 1977. Ed. Erizzo, Venice. 293 pp., 55 colour plates, numerous but unnumbered photographs, line drawings, tables, etc., in text, price not stated.

Ten years of excavations by Italian archaeologists and naturalists at the proto-urban site of Shahr-i-Sokhta (Iranian for 'burnt city') in Iranian Sistan, almost on the frontier with Afghanistan are published in this lavish publication, written by 19 distinguished scholars, all specialists in their own fields. It is an intermediate report on the work done so far and, most intelligently, it is presented in two languages, Italian and English. As a model for the close co-operation of archaeologists and their confrères in the natural sciences, the Shahr-i-Sokhta dig closely approaches perfection, if that is possible in our field of study. Scientists must love it, and so does the reviewer, for this is what we want in modern archaeology, and try to achieve, though few of us are granted the means to accomplish it, either in the field or in publication. Now our Italian colleagues have shown that it can be done, and done well. Who would not like to see similar splendid publications, implying the same amount of multi-disciplinary research on other important sites? Alas, this is not yet the norm, as it should be at the beginning of the 1980s.

The index on p. 357, modestly put on the last page of the book, shows what it contains; a foreword by G. Tucci; An historical outline by S. Salvatori; Sistan: the geographical aspects of Shahr-i-Sokhta by G. De Marco and A. Dinelli. This is followed by Shahr-i-Sokhta; the protohistoric settlement and the chronological sequence by R. Biscione, S. Salvatori, and M. Tosi and there follows an account on the graveyard by M. Piperno, with a study on the anthropological characters [*sic*] of the inhabitants of Shahr-i-Sokhta by E. Pardini. Next follows a section entitled 'The part played by plants and animals in the life of the city'; The plants by L. Constantini; The fish by R. Tortonese; The avifauna by P. Cassoli; The mammals by L. Caloi and B. Compagnoni. S. Durante then tells us about trading relations in sea-shells between inland Iran and the coasts of the Indian ocean. This in turn is followed by Food supplies at Shahr-i-Sokhta by G. Ligabue, Seals and impressions by S. Tusa. Stone-working techniques and bone industry by G. M. Bulgarelli, Population and natural resources in prehistoric Sistan by L. Constantini and M. Tosi.

This, by any standards, is a pretty impressive record, and it would be grossly unfair on the part of any reviewer to harp about any omissions or lack of emphasis in the field in which he is most interested. Yet, having said that, a chapter on foreign relations, more details of the archaeological building complexes, another on the chronology in terms of calibrated radiocarbon dates, and perhaps one on the religion of the inhabitants might have been included. Hopefully we shall get this in a

second volume. This is a splendid book about a splendid effort – 10 years of it – in one of the most desolate parts of Central Asia, a desolation that was man-made long after the end of Shahr-i-Sokhta, in fact only in the 14th century AD, when Tamerlane's hordes reduced 'the garden of Seistan' to the plains of death (Dasht-i-Margo) and hell (Jehennem) and a once prosperous unidentified city into Shahr-i-Golghola, 'The City of Screams'. Shahr-i-Sokhta, however, long before had declined and was burned at a similar crisis in Central Asia when the Indus civilisation collapsed and the lucrative lapis lazuli trade to the west via southern Iran came to an end, *c.* 2000 BC.

J. MELLAART

MOOREY, P. R. S. *Kish excavations 1923–1933 with a microfiche catalogue of the objects in Oxford excavated by the Oxford–Field Museum, Chicago, expedition to Kish in Iraq, 1923–1933.* Oxford, Clarendon Press, 1978. xvi + 213 pp., 4 microfiches, 20 figs. £15.00.

Dr Moorey has done for Kish what Louis le Breton did for Susa on a smaller scale. He has reconstructed from the expedition archives excavations which, except for Mackay's work, were badly dug and badly published. It is a great work of research undertaken over several years, arising from a need to catalogue the Kish collection in the Ashmolean Museum. The originally independent research into the Kish archives in Chicago by McQuire Gibson for a thesis[1] enabled the reconstruction to be completed. The Oxford–Field Museum Expedition ran for 10 seasons from 1923 to 1933. Stephen Langdon, Professor of Assyriology at Oxford, was overall director but he was only in the field for two seasons, the second and the fourth. At other times the excavations were organised by a field director who was instructed by letter and sent weekly reports and photographs. The field director from 1923 to 1926 was Ernest Mackay and from 1926 to 1933 Louis Watelin, a Frenchman from Susa. Mackay moved to the Indus valley in 1926 and Watelin died in 1934 before publication of the excavations could be completed. Langdon himself died prematurely in 1937[2] when the Kish material was scattered between Oxford, Chicago and Baghdad. Dr Moorey's book is a complete review of the history of the excavations of Kish and neighbouring sites by the Oxford–Field Museum Expedition. It begins with an account of the early visitors and previous excavations and finishes with a useful chapter on the history of the city from *c.* 3000 BC to AD 650. There is a printing error on p. 171: Ur Zababa was a ruler of the Fourth Dynasty of Kish, not Ur. A detailed catalogue of the Kish material in the Ashmolean Museum with illustrations is provided on microfiches. The sections on the Plano Convex Building, Ingharra deep sounding and Jamdat Nasr, are based on articles in *Iraq,* XXVII, pt. 2, 1964; XXVIII, pt. 1, 1966; and XXXVIII, pt. 2, 1976, respectively.

The Oxford–Field Museum Expedition began, as their predecessors had done, with the most upstanding landmark: the mound of Ukhaimir containing a ziggurat and temple of Zababa. Mackay's plans are lost and there is only a brief summary of the excavations by Langdon with a worked-up plan and a footnote to the effect that plans and a more minute description of Mr Mackay's work will be published by the excavator himself (Langdon, *Excavations at Kish,* I: 65). According to a report in the Chicago archives, Mackay dated the main red-brick core by a tablet found on the summit. Dr Moorey has located this tablet which he says is undated, but the likeness in size of the bricks in the core with the inscribed bricks of Samsu-iluna lying in debris support Mackay's attribution. The lowest facing of the ziggurat is associated with a pavement of Nebuchadnessor II. The loss of Mackay's plans and report render any account of the temple excavations unsatisfactory. The only certain dating seems to be the great retaining wall and platform on the southern side by Adad-apal-iddina, who also built a structure against the south-east side of the ziggurat.

The palace on mound A was carefully published by Mackay. The best dating evidence is the Fara-type tablet built into a platform serving some 'industrial' purpose, which must belong to the life of the palace. Moorey also considers that the ED.11 seal found just above the footings in room 25 in the north-west wing of the palace, the oldest, belongs to the palace and was not washed out from a grave as Mackay thought, giving a *terminus post quem* for the construction of the palace. Moorey gives a thorough survey of material from the overlying cemetery A and concludes that it was used for a comparatively short period between ED.111B and Agade. The penultimate chapter summarises the excavations of Sassanian remains on mound H. The plans and drawings of these were only published in the Sassanian section of Arthur Upham Pope's *Survey of Persion Art.* Four villas or palace buildings were completely uncovered and elaborate stucco ornament found.

[1] *The City and Area of Kish,* Field Research Projects, Miami, 1972.

[2] According to Henry Field (Gibsen, *op. cit.* 96, note 52) Langdon had to walk 18 miles (back from Jamdat Nasr) in heavy rain, caught pneumonia and nearly died in Baghdad, which permanently impaired his health.

The excavations of the Oxford–Field Museum have left two important questions unanswered: what were the antecedents of the handsome ED.111 palaces (p. 41 ff)? And was the building uncovered by Langdon at Jamdat Nasr a palace or an administrative building attached to a temple, as the author seems to think (p. 151 ff)? The finding of a composite seal impression showing pictographic rendering of the names of a number of cities as in the archaic tablet strata at Ur indicates some regional supply organisation of an authority powerful enough to impose it.

A second contentious question is whether the two elevations behind the later Neo-Babylonian temple at Ingharra were staged ziggurats. Being of plano-convex brick and dating to ED.111, they would be the earliest evidence for a structure of this kind (p. 85 ff). Mackey said he found evidence of staging in his trench into the north-west side of the smaller ziggurat, and Longdon published a photograph purporting to show 'the outer wall of the lowest stage of the tower', i.e. the larger ziggurat (*Art & Archaeology* (Archaeological Institute of America) vol. XXIV, 4 October 1927: 104–5, Fig. 4) which he said rose in four succeeding stages to a height of at least 200 ft (*op. cit.* vol. XXXV, November 1928: 160). Although Dr Moorey regards Langdon's statement as fanciful (p. 88, note 32), he accepts that there was evidence of a stage tower rather than a temple on a platform. Mallowan was inclined to accept this (*CAH* I, 2, XVI: 273), but Seton Lloyd though the evidence equivocal (*Iraq*, XXXI, 1969: 42). The Jamdat Nasr period temple at Tell Uqair was set on a platform of two stages and it seems probable that Ur Nammu's architects were working upon some kind of precedent when they built the ziggurat at Ur. Only further excavation can settle these questions. In the meantime, Dr Moorey's book takes us as far as it is possible to go in elucidating the results of the Oxford–Field Museum excavations.

BARBARA MALLOWAN

South Asian Archaeology 1975. Papers from the Third International Conference of South Asian Archaeologists in Western Europe, held in Paris in 1973. Edited by J. E. Lohuizen-de Leeuw. Leiden, E. J. Brill, 1979. 187 pp., 69 figs., 94 pls., 160 fn.

This is the third volume resulting from the series of biennial conferences first held in Cambridge in 1971. Like the earlier conference proceedings the volume has no common theme and the 14 topics range from studies of prehistoric seals and sealings in eastern Iran, to an analysis of the structural symbolism of Rajasthani cloth paintings of the early 20th century.

The volume is dedicated to the memory of Jean-Marie Casal, Chairman of the 1975 Conference, excavator of Virampatnam-Arikamedu, Mundigak, Amri, Nindowari and Pirak, and who died in December 1977 at Antibes, before this publication was available.

Geographically the emphasis of the book is on the Indo-Iranian plateau and the western borderlands of South Asia, and only four contributors report on materials or monuments from India. This bias partly reflects the difficulty Western archaeologists experience in undertaking basic research in India and the easier access, over the past decade, to Pakistan, Afghanistan, Iran and the Gulf States. Following the recent political upheavals in Iran and Afghanistan one wonders what South Asian archaeologists in Western Europe will have to report at their 1981 Conference.

This volume is as well produced, and more handsomely illustrated than its predecessors; but at a cost. It has taken four years to reach the library shelves, becoming available only after the publication of the Fourth Conference at Naples in 1977 (*South Asian Archaeology 1977.* Edited by M. Taddei. Naples, Instituto Universitario Orientale, 1979. 938 pp. 41,250 Lire), and at a price of nearly 10 times as much per page of text. And this despite a contribution towards the cost of publication by the French Government and what is referred to by the Editor as 'cheap computographic printing'. The exorbitant price of this volume puts it beyond the reach of all students and most professional archaeologists and this should surely lead the editorial committee of the association to consider the merits of more rapid and economical means of publication.

I. C. GLOVER

PARPOLA, S. *Neo-Assyrian letters from the Kuyunjik Collection* (Cuneiform texts from the Babylonian tablets in the British Museum 53). London, British Museum Publications, 1979. 27 pp., 219 pls. £12.50.

DIETRICH, M. *Neo-Babylonian letters from the Kuyunjik Collection* (Cuneiform texts from the Babylonian tablets in the British Museum 54). London, British Museum Publications, 1979. 33 pp., 139 pls. £10.00.

These latest volumes of the Cuneiform Text series contain important additions to the corpus of letters published by R. F. Harper in his *Assyrian and Babylonian Letters* (London and Chicago, 1892–1914). These new publications of letters are both welcome and long overdue.

Part 53 contains letters in the Assyrian dialect of Akkadian and reflects S. Parpola's work with K. Deller, who contributed copies of 40 tablets to the volume. Parpola has included extensive and useful indices, such as a concordance indicating which tablets had been previously published in Harper's *ABL*, or transliterated and translated in Parpola's *Letters from Assyrian Scholars* (AOAT 5/1), or published by M. Fales in *Assur*, 1/3, 1974: 5–24. Particularly useful is the subject index which gives the main subject matter of the letters, the reign of the king when written (if known), and the names of who sent or received the letter.

The present writer has collated a selection of tablets from this volume. The copies of those tablets checked are for the most part accurate, although the copies are marred by two flaws. First, the copies of tablets in the latter half of the volume are faint, and occasionally only barely legible, and one suspects that the plates were made from pencil copies only. Although inking copies is a time-consuming endeavour, the final product justifies this labour. Second, Parpola's copies tend to complete broken signs from the edges of tablets, which was a method employed by L. W. King but not generally followed by later copyists. Completing broken signs is a matter of interpretation, although the reader cannot know how much of the sign is actually visible on the tablet. Moreover, some of Parpola's interpretations are not borne out by collation, as in the following cases:

83-1-18, 808 (Plate 210, 949), 2′: the copy has ⌈*a-na*⌉, although the traces on the tablet could also be [*ša*]. In 1. 1′, the second and third signs appear to be *du* and *ta* on the tablet.

K 16107 (Plate 169, 760), 3′, *id* is complete on the tablet. Despite these flaws, we must sincerely thank S. Parpola for this invaluable work which brings much new material to light.

Part 54 by M. Dietrich, containing letters in Babylonian dialect, is also equipped with indices of senders and addressees, an index of joins, and a concordance of previous publications such as Harper's *ABL*. The subject catalogue provides the names or titles of the sender or addressee, and the city where the letter was written, but lamentably it does not group the letters according to subject matter, as did Part 53. Moreover, Dietrich does refer the reader to his previous publications of these tablets in *AOAT*, 7, 1970, and *WO*, 4 and 5, 1967–70, although it should be noted that these publications do not edit individual tablets in full, but only discuss or transcribe relevant passages in these texts. No edition of these texts is yet available for the non-specialist.

As for the copies themselves, a spot check of selected tablets confirms the general accuracy of the copies, with some exceptions, notably K 1353 (Plate 10–11), rev. 1, in which the copy has lú, although the tablet shows a clear šeš-sign; such a misreading of 'man' for 'brother' can easily lead to a misinterpretation of the contents of the letter.

The author has provided a wealth of material for which specialists will be grateful for years to come.

M. J. GELLER

STARK, Barbara L. and VOORHIES, Barbara (*eds*). *Prehistoric coastal adaptations: the economy and ecology of maritime Middle America* (Studies in Archaeology). London, Academic Press, 1978. xxx + 313 pp., figs. £13.65.

This collection of papers seems to be an earnest attempt to draw together current research data in the area of coastal settlement and subsistence. The geographical areas represented are largely situated in the sub-Maya zones of Meso-America and tend to be based on the investigation of extremely restricted sites or locations.

The book is divided into several sections: Introduction (which summarises previous research on this topic), Procurement Patterns, Settlement Patterns, Exchange Patterns, and Overview which contains a useful commentary by W. T. Sanders and a guide to future research directions by the editors.

The general area of investigation has constituted something of a blindspot in the past and therefore the book represents a welcome move away from the quasi-urban areas that the majority of researchers have traditionally focused upon. The result, though, is disappointing. The papers serve only as a working guide to the state of research, rather than as a definitive work on the subject. For this reason criticism of the individual papers seems unnecessary as they do largely represent incomplete or ongoing research. However, there are some comments that may be legitimately made concerning the methods of research employed and the presentation of data, both generally and with reference to specific articles.

To begin with, the 'prehistoric' of the title is misleading; as with much of American archaeology, there tends to be a strong anthropological bias. Several papers deal with relatively recent Indian populations, e.g. R. W. Magnus 'The Prehistoric and Modern Subsistence Patterns on the Atlantic Coast of Nicaragua: A Comparison', and 'Coastal Adaptations as Contact Phenomena Among the Miskito and Cuna Indians of Lower Central America' by Mary Helms.

David Freidel's contribution, 'Maritime Adaptation and the Rise of Maya Civilisation: The View from Cerros, Belize', reads like an interim excavation report as it contains too much irrelevant strati-

graphic detail; this ultimately obscures the point of his paper and contributes little to the general theme of the book.

Elizabeth S. Wing's paper, 'The Use of Dogs for Food: An Adaptation to the Coastal Environment', occupies 11 sides, five of which contain text and illustrations, the other six bearing tables. The conclusions are simplistic and the tables inadequately commented upon, as the information contained in them is largely difficult to assimilate.

One article, that by Judith Zeitlen, 'Changing Patterns of Resource Exploitation, Settlement Distribution, and Demography in the Southern Isthmus of Tehuantepec, Mexico', contains an example of apparently spurious logic that the editors should, perhaps, have modified prior to publication: 'For each phase the usage intensity for terrestrial fauna was calculated by totalling the edible volume of meat provided by all individuals and dividing that figure by the total number of potsherds found in components of the phase' (p. 157). Nowhere is the reasoning behind this method explained and there is no explanation offered for the presentation of meat yields in litres, as opposed to the more usual method of weight estimates.

In general there is evidence of the uncritical application of models applied to insubstantial data, a flaw that permeates American archaeology as a whole, but is particularly disturbing in this book. In addition, some lines of research appear to have been conditioned by *a priori* assumptions, e.g. that the resources available in coastal regions were both plentiful and easily accessible, and that precocious sedentarism developed as a result.

There is an inability, or disinclination, on the part of the authors to integrate the parochial with the larger, more generalised trends observable in Meso-American archaeology as a whole. Nowhere is there an adequate attempt to assess the significance of the coastal sites politically, socially or economically. Consequently, there is no apparent awareness of the fact that coastal settlements in the Mexican, Mayan or Lower Central American areas may reflect diversities that are due to the essential differences in the ethnic and cultural backgrounds of these zones.

W. T. Sanders' summary exposes the flaws in many of the research approaches and suggests the employment of more stringent methods of analysis in order to obtain more satisfactory results. His comments tend to suggest that certain caveats are necessary when assessing the data presented in these papers; the student, especially, should be aware that some of the information is limited and unreliable.

LEA JONES

DONNAN, C. B. and MACKEY, C. J. *Ancient burial patterns of the Moche Valley, Peru.* Austin and London, University of Texas Press, 1978. xii + 412 pp., 9 maps, 17 pls. £17.50, $24.95.

The museums of the Western world are replete with pottery, textiles and jewellery from ancient Peruvian graves. Unfortunately the majority of these objects are the spoils of intensive looting by grave robbers rather than the fruit of carefully recorded excavations so that the information they convey is less than it should be. It is therefore heartening to those who work in coastal Peru to know that there are still some unlooted graves that can be excavated, for it is these that form the subject of a book that does record the burial associations for one of the most heavily looted regions of Peru.

Between 1969 and 1975 the authors and various students excavated 103 burials during the course of two separate projects in the Moche Valley. These represent most but not all prehistoric time periods and were found in a wide range of sites within an area roughly 25 by 15 km on the plain around the mouth of the Moche River. They are arranged in chronological sequence from the Preceramic to the Late Horizon under the headings of the north coast time periods, such as Cupisnique, Salinar, Gallinazo, etc. The authors begin each section with photographs of some of the relevant vessels and a description of what ceramic traits are diagnostic of the period and then follow this with a catalogue of the burials, each numbered, and finally a summary of the burial practices with comparisons from other north coast areas, if data is available. The focal part of these sections is the burial catalogue in which each numbered burial is described according to the same format, that is with field number, date of excavation, excavator, burial context, age and sex of skeleton, description of the associated grave goods and general comments. All this is on the left page. On the facing one there is drawn to scale a plan of the burial and its contents; on the following pages there are drawings, all to the same scale, of the accompanying vessels and artefacts, provided they were in reasonable condition. There are two appendices. One by William Conklin and Eduardo Versteylen discusses the textiles from one of the Moche III burials, the only one where they were sufficiently well preserved to warrant analysis. The other by Christopher Donnan and Leonard Foote gives an interesting account of what are probably sacrificed children and llamas of the Late Intermediate Period. Incidentally, this appears to be the only burial for which a radiocarbon date was taken.

The virtues of the book are readily apparent in its general organisation and the clarity of the plans which enable the reader to grasp easily the position of the skeleton and the spatial relationship

between each artefact and the skeleton. The descriptions are concise and careful and the comments to the point. The drawings of the artefacts are well executed and together with the photographs give a clear idea of each vessel. The work does, however, raise more questions than it answers.

In the first place, their sample is extremely uneven with regard to sex, age and time period to enable much analysis of changes in mortuary practice from period to period or of differences between various strata of society within periods. As might be expected, Moche IV and Early Chimu, which are Middle Horizon and early Late Intermediate Period according to their chronological chart, provided the bulk of the sample with 28 and 31 burials respectively. Nine of the Early Chimu grave lots, however, were purchased from huaqueros (grave robbers) and consequently most of the context lost, as the authors themselves admit. The Middle Chimu sample consists of only 15 burials, less than half those of the preceding period. They have no grave lots for the Preceramic, the Early Horizon, Moche II or Moche V and only 12 for the whole of the Early Intermediate Period. In this connection I find the lack of Moche V burials odd, particularly in trench B which was excavated between the Huaca del Sol and the Huaca de la Luna, since there is a good sample of Moche IV and Early Chimu there. If, as they assert in their section entitled 'Huari', the picture in the Middle Horizon is one of 'strong cultural continuity', why is there an apparent shift of population from the southern margin of the valley to the northern margin and why are the famous pyramids abandoned until the Early Chimu period? What it does suggest is that a reassessment of our assumptions about the Middle Horizon is long overdue.

Secondly, we are not told what criteria were used to estimate the age and the sex of the skeletons nor whether graduate students or physical anthropologists were involved. If it is the work of the former, it would be good to know that the material will be examined by a physical anthropologist in the near future, particularly from those periods with the larger sample. Such studies are very much needed for ancient Peru and there are all too few comments on the pathology of the skeletons here. It would also be nice to have some vertical context and radiocarbon dates for some of the grave lots, particularly in the case of the above-mentioned trench B, where there are burials of four different periods. It is to be hoped that the various excavators will soon publish individual excavation reports for the sites involved, for in the bibliography there are rather too many references to manuscripts and unpublished BA and PhD theses, that are virtually unobtainable in this country.

To my mind one of the most interesting phenomena about the burials, which passes without comment in the book, is the obvious duplication or quasi-duplication of certain pots in a grave. They are even found in triplicate and quadruplicate. It occurs in Moche IV, possibly in Early Chimu, where there are less pots per grave, and in Middle Chimu, that is in the periods with the largest samples. It is a phenomenon that occurs in coastal Peruvian graves throughout many periods and would seem to require serious investigation.

Finally, a word should be said about the appalling waste of paper in this book. No one appreciates more than I the convenience of having descriptions and drawings facing one another, and the latter all to the same scale, but without including the preface and title pages I counted 28 full pages and 86 half pages as complete blanks, more than one-sixth of the book. Surely many of the Early and Middle Chimu burials could have been doubled up on two facing pages rather than waste all this paper.

In sum, this is the beginning of what should prove to be some very interesting studies on Moche Valley history and culture, but it is a beginning and it is to be hoped that the site reports will provide a little more flesh with the bones.

JANE FELTHAM

BLANTON, R. E. *Monte Alban: Settlement patterns at the Ancient Zapotec capital.* New York, Academic Press, 1978. xxvi + 451 pp., 9 pls., 152 figs., 10 tables, 10 appendices. £18.60.

This book is the first volume to appear describing and analysing information collected from the Valley of Oaxaca Settlement Pattern Project begun in 1971 and directed by Richard Blanton. The book concentrates on Monte Alban which was the initial object of the survey; later surveys concentrated on the valley's central region and southern arm, and the data from these surveys are to be summarised and analysed in a future volume.

Adapting strategies from the surveys of the Valley of Mexico by Millon, Sanders *et al.*, and utilising information from Flannery's Oaxaca Human Ecology Project, and Caso, Bernal and Acosta's ceramic sequence of the Valley of Oaxaca, Blanton has provided us with a well-produced text of description and analysis.

In the introduction, Blanton indicates that he hopes the data collected will help him to (1) establish Monte Alban's function and nature; (2) determine the changes through time, the extent and density of occupation of the site and estimation of the population; (3) outline the changes in the city's internal organisation which may lead to an understanding of changing patterns of political control and social stratification as well as the city's regional role; (4) determine the nature of craft production and

exchange within the community and its regional economic role. Through a very good presentation, using maps, graphs, data tables, etc., Blanton provides solutions for each to varying levels of reliability, and draws conclusions with which there should not be any major disagreement.

However, it is disappointing that Blanton did not risk a few extended comments about the nature of the relationship between Teotihuacan and Monte Alban, apart from claiming that the functions of the two were different. In discussing the origins of Monte Alban, he suggests that it was founded at a neutral site (at the junction of the three arms of the valley) in order to become the capital of a military league. He does not tell us who established this league nor really why it was established, claiming only that it was unlikely the league was formed to protect its members from the Teotihuacanos, as Teotihuacan was not well developed at the time of the foundation of Monte Alban (*c.* 500 BC). He does believe, however, that the collapse of Teotihuacan (*c.* 700 AD) stimulated the decline of Monte Alban – which seems to have occurred about that time – as presumably a military league was no longer required to protect its members from what had become a rather powerful Teotihuacan. There certainly may be a link in the collapse of the two centres, but more should be known about the nature of the relationship between the two before we can discuss how the collapse of Teotihuacan disturbed the relationship and stimulated the decline of Monte Alban. But what was the nature of the relationship between the grand commercial and political capital of Teotihuacan and the political–military capital of Monte Alban? Perhaps Blanton will reveal this in the next volume.

One strong complaint about the book concerns the appendices. These account for approximately 70% of the volume of the book. Rather a lot I thought. Are all the appendices really useful and necessary? Some undoubtedly are; such as appendix II, which provides a description of the ceramic categories; VII, which provides all the grid square maps at 1 : 2,000 (I hope to see the completed map soon); and the last three appendices, VIII–X, which contain descriptions of figurines and urn fragments, test excavations at terrace 1227, and a structure summary and ink drawings of field maps, respectively. However, the need to place appendices I, and III–V, on terrace data, ceramic tabulations and sherd densities, is open to question. These appendices contain about 100 pages of computer print-out, which is not the most enjoyable reading. A far more efficient and certainly economical method of including such data would be through the use of microfiche. At £16, any method of reducing the cost of the book would have been appreciated.

Despite this complaint, Blanton has provided us with a good summary of his discoveries made from the field survey and brought forth some interesting suggestions, suggestions which should be expanded in the future. I now eagerly await the arrival of the second volume.

BRUCE WELSH

MEGAW, J. V. S. (*ed.*). *Hunters, gatherers and first farmers beyond Europe. An archaeological survey.* Leicester, Leicester University Press, 1977. 256 pp., 80 figs. £5.95.

This book contains 11 essays originally presented at an adult education residential conference in Leicester in March 1974. The central theme of that symposium was the transition from a hunting, gathering mode of subsistence to that of animal and plant domestication – from foraging to farming as one of the contributors puts it – as seen by archaeologists in regions outside Europe. Perhaps because of this genesis most of the essays are intended to introduce the reader to current archaeological thinking in the various regions, rather than to make substantive points or develop theoretical positions. The book is thus aimed at a wide group of interested but untutored readers. As the editor says in his preface, 'this is not a text-book for a limited audience of impressed students and specialist scholars'. For these reasons also the essays are short in text but well provided with maps, tables, graphs, photographs and drawings.

The nature and causes of the extensive cultural change which is the central focus of these essays have bedevilled archaeologists and anthropologists for about 100 years (e.g. Roth, 1887), receiving greater impetus from the 1930s onwards from Childe's account of the Neolithic Revolution. Today we ask different questions and we know a great deal more about the factors involved and about their chronological framework; none the less as a research topic it still attracts a vast amount of consideration. None of the essays in this book is meant to solve any major problems but rather to tell us what the state of play is in a number of widely separate regions.

The initial chapters, by Brothwell, Alexander and Orme, provide background to the general questions of how, why and to what effect the transition to food production took place. These are followed by the regional studies: one of the Near East; one of West Africa; four in the Indo-Pacific area; and two in the New World. As introductions these essays make informative and interesting reading. Although specialists in each of the areas may wish to make criticisms of detail or emphasis, considered as a whole the collection is useful in providing a wider than usual coverage of world archaeology.

Each of the articles (with the exception of Gathercole's on Polynesia) has a good bibliography for readers who want to know more. Gathercole (p. 197) commented on the lack (at the time of writing) of archaeological texts covering the whole area of the Pacific. Archaeological research proceeds apace however and since then such sources have been produced (e.g. Bellwood, 1978, 1979). This fact points to what might be considered the most significant difficulty with this book – the supersedure of the information it contains within the very near future. No doubt this is a problem for any publication in a dynamic discipline but it is perhaps more pertinent here because of the summarising nature of the essays and the three-year period between event and publication.

Despite these difficulties the essays in this collection can help to broaden the horizons of British prehistorians. In that sense alone this book is a welcome (if belated) recognition of much good work being done in far-off- places.

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GARY PRESLAND

ALLCHIN, F. R. and HAMMOND, Norman (*eds*). *The archaeology of Afghanistan from earliest times to the Timurid period.* London/New York, Academic Press. xxiv + 451 pp., illus. £30.00.

One must begin by stating that this general work is a valuable guide to current research in an area that was once regarded as being of only marginal importance to West and South Asian studies, but that is now increasingly seen to furnish important links between Central Asia, the Indian subcontinent, and the Near East. The editors realise (p. 1) that there has been very little work of synthesis done in this field and (p. 2) explain their choice of format as being that best suited to the rapid presentation of an introduction to the nature and quality of Afghan geography and archaeology within the larger framework of the cultural sequences of Western, Central and Southern Asia. As many different specialists have contributed there is no unified theoretical approach, but this is inevitable given the present fragmentary state of our knowledge and does not detract from the value of the book as a work of reference.

The book contains the following chapters: 'The geographic background'; 'The palaeolithic'; 'The later prehistoric periods'; 'The early historic period: Achaemenids and Greeks'; 'The pre-Muslim period'; 'From the rise of Islam to the Mongol invasions'; 'From the Mongols to the Mughals'. In addition the editors have supplied an introduction and a concluding chapter in which the remarks of each of the contributors are briefly summarised.

The best-documented chapters, and incidentally those most within this reviewer's competence to criticise, are 3, 'The later prehistoric periods', by J. G. Shaffer; 4, 'The early historic period: Achaemenids and Greeks', and 5, 'The pre-Muslim period', by D. W. MacDowall and M. Taddei. These have the most solid base of excavated material to build on, since palaeolithic research in Afghanistan is still in its infancy, and more work has been concentrated on the recording and restoration of Islamic remains than their excavation. Professor Shaffer's chapter contains a long and most useful digest and comparison of the pioneering excavations at Mundigak near Kandahar in southern Afghanistan with later work in the same area (pp. 90–181, to which one should now add Shaffer, 1978); he also studies the early neolithic (pp. 71–90), and the northern Afghan neolithic and bronze ages which bear strong resemblances to the material excavated in Soviet Central Asia (pp. 181–6). The only regrettable omission is that neither Shaffer nor MacDowall and Taddei discuss the latest occupations at Mundigak (VI–VII), which bridged the gap between the prehistoric and the historic occupations of southern Afghanistan, and which is also represented at the excavations at the Old City of Kandahar. One is thereby left with an awkward gap in the local cultural sequence that would otherwise document the transition from prehistoric urbanism to fully historic participation in the Achaemenid empire's eastern fringes.

MacDowall and Taddei's two chapters encompass between them the results of much careful numismatic work and also the results of excavations at Hellenistic and Kushan sites in central and northern Afghanistan, and in particular Ai Khanum on the Oxus, Surkh Kotal, and Begram. While necessarily brief these reports are precise and informative and have full references to the literature.

The bibliography is gratifyingly full, although for comparative material on Soviet excavations one should also consult Deshayes (1976) and the references therein. There are a few points that catch

the eye: regrettably, at the time of writing this review (May 1979), the *Journal of Afghan Studies* of the British Institute of Afghan Studies (mentioned on pp. xxiii and 230) has not yet appeared and so the excavations at the Old City of Kandahar are as yet unpublished; there are many misprints and the quality of the reproduction of figures is uneven, particularly in Professor Shaffer's chapter; surprisingly, no publishers' names are given in the bibliography, although some of the titles are not familiar and could prove difficult to trace. Finally, mention must be made of the recent publication of a preliminary report on the excavations at the Harappan site of Shortugai on the Oxus, mentioned on pp. xxi and 408 (Francfort and Pottier, 1978).

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DAVID FLEMING

HUMPHREY, J. H. (*ed.*). *Excavations at Carthage 1975, conducted by the University of Michigan*, Vol. 1. Tunis, 1976. 203 pp., 21 figs., 15 tables, 36 pls (black and white and colour). $25, paperback $16.

Excavations at Carthage 1975..., Vol. II. Ann Arbor, 1978. 319 pp., 40 pls. $28, paperback $18.

Excavations at Carthage 1976..., Vol. III. Ann Arbor, 1977. 173 pp., numerous figs. and black and white pls, 2 foldouts. $15, paperback $9.

Excavations at Carthage 1976..., Vol. IV. Ann Arbor, 1978. 189 pp., 18 pls, (black and white and colour), 32 figs. $25, paperback $16.

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This review comprises the four volumes published to date by the Michigan University on their work at Carthage as part of the 'Save Carthage' project. This project launched by UNESCO in 1971 has involved teams from the United States, France, Italy, Denmark, Britain, Poland, Germany, Canada and Bulgaria. Each of them has worked on a preselected site within the area of the ancient city, which, despite its long history and contribution to Western civilisation is being seriously threatened by urban encroachment from nearby Tunis. While other teams have not been slow in producing annual interims or bulletins, these Michigan volumes should be seen less as one of these and more as a 'running progress' on aspects of the excavations and research-results and problems. This implies a considerable amount of speed, care and co-ordination from all concerned; however, in describing the excavations and related problems, excessive preoccupation with details gives one the impression of the excavators being hamstrung by the complexities of the site. This in some way mars the picture produced, and adds an awkwardness to the presentation of data.

1. *The excavations*

Initial excavation began at 'The House of the Greek Charioteers' (Vol. I, pp. 27–119: Vol. III, pp. 96–113), which was built close to the centre of the Roman town in the late 4th century AD. In addition to a peristyle, it possessed an *Oecus*, with side rooms, and was built upon the site of an earlier occupation. This appears to have begun in the ?Augustan phase, and to have formed part on one of the original lots into which the various Insulae of the Colonia were divided. Evidence for this phase is none too clear, and has only been sampled through 'probe' sections, and in pits cut through the later 6th century AD floor. In short, the late 4th century house seems to rest on a largely unexplored 1st century AD terracing which, from the lines of later robber trenches, seems to have had similar dimensions to the later house. Time spent in unravelling the complex series of compressed later deposits on both sites has meant that neither Michigan site can offer more than tantalising glimpses

of pre late 4th century AD levels. Compensation however, can be found in levels on the Harvard ASOR Punic Project, the British 'Admiralty Island', etc.

In the later 4th century AD, the 'House of the Greek Charioteers' proper was built, and boasted an *Oecus* mosaic showing a threshold decoration of four Greek charioteers and an acanthus border (see study by K. M. Dunbabin, Vol. I, pp. 21 ff). The other rooms around the columned peristyle were also decorated with tesselated pavements (see Dunbabin's typology of the 260-odd fragments, in Vol. IV, pp. 169 ff). Like other houses in Carthage and Roman Tunisia, the house was provided with a very capacious cistern, reused from an earlier phase (see the short study by R. L. Vann, in Vol. III, pp. 116 ff). In common with the 'Ecclesiastical Complex', very little surface stratigraphy has survived, and the site's phasing has caused the excavators a lot of problems in excavation technique, and necessitating large open area excavation to uncover the compressed deposits; these have in turn been disturbed by various phases of robbing in the Roman–Modern period. However, it must be fairly said that these are problems that are not unique to the Michigan site (in Carthage, or other urban Mediterranean sites), and one has the impression through Vols I–III of the excavators only gradually beginning to master the problems presented by the techniques best employed for this type of site. One critique ventured here is that despite an argument against their utility here (except for the NS section through the Eastern street frontage of the house, Vol. III, pp. 110 ff), and the fact that the plans largely compensate for their absence (Vol. II, pp. 29 ff and end figs 1, 2) a few cross-sections through the site with spot heights, might have been useful to gain a three-dimensional comprehension of the site and its deposits.

The second phase of this house saw reconstructions in various parts in the early to middle 6th century AD. Minor refractions occurred in the courtyard in the mid to late 6th century AD. A final and undatable phase would seem to take occupation on this site down into the late 6th century AD and the Arab invasion.

The 'Ecclesiastical Complex' lies to the south-west of the 'House of the Charioteers', and may have been connected with the Basilica lying to the south-east (see Vol. IV, pp. 5 ff). The complex seems to have had at least five phases (in the broadest sense of the word) dating from an as yet (1976) unexcavated horizon of the late 5th/early 6th centuries AD period (in theory) through until Phase V. However out of these, only Phase III was a clearly defined occupation level. This excavation provides very interesting evidence for ordered domestic occupation within the shell of an earlier Ecclesiastical Complex (given a hypothetical Byzantine date) a symptom of the apparently early decline of the African Church. This had reached desperate straits by *c.* 650 AD, prior to the Arab invasions. The type of occupation consisted of a series of mudbrick walls upon stone sleepers, and intersected by pathways. As with the other site, interpretation is found difficult because of medieval and modern disturbance, as well as extensive stone robbing, and consequently the phasing offered leaves some misgivings. As it is, disturbance appears the cause of the dating hiatus in the later Phases IV and V, where pottery and stratigraphy clash (high residuality of early forms and presence of Fatimid pottery) viz., Vb, while the coins of Phases III and IV are predominantly later than those in V (Vol. IV, pp. vi ff, 166 ff). It should perhaps be stated that until we know more about the relative quantity of types, and the length of circulation of Byzantine coins, conclusions based on under 10 coins should be regarded sceptically: hence the pointless remark in Vol. IV (pp. 167, para 1) the reason why this site receives no Justinianic folles is not a local one (i.e. because of a gap in the occupation of the Complex after the early years of the Byzantine reconquest, which causes Humphrey to place the dating of the unexcavated initial phase of the Complex to late 5th/early 6th centuries AD), but a problem in the mechanics of coin supply (or use) to the town as a whole, as the same phenomenon occurs on the British sites.

2 *Dating evidence*

The two excavations have provided to date, some 1,869 Roman Vandal and Byzantine coins (*Buttrey,* Vols 1 and IV, pp. 157 ff and 99 ff respectively), the largest collection yet from any published North African site. Their usefulness is only partially offset by many of the coins being partly or totally illegible, something common to other sites in Carthage, and in Alexandria. A lot of surprises however came from the pottery, examined in Vols I (pp. 47–157), II (pp. 113–18), and IV (pp. 23–98), where selected pieces are drawn from the various deposits, and the relevance of various types to old typologies or their role in new ones is examined. This is followed by a tabular quantification of all types by count (rims, bases, handles, and body sherds), and weight (RBHS also). The quantification of the pottery thus by Riley is to be welcomed, and despite very usable material from the excavations at Ostia and Luni (Italy), this represents its first published appearance on a west Mediterranean site. Being the fruit of experiment by Riley and Hayes on east Mediterranean sites, the method allows the vast amounts of pottery common on Mediterranean sites to be more quickly and completely recorded (Vol. I, pp. 125 ff). Consequent comparison with sites recording pottery in a similar way permits a far more accurate and objective picture of economic trends to be built up.

Consequent work on pottery typologies are too numerous to list here adequately. However, a typology is established by Hayes for the early 1st century AD 'Imitation Terra Sigillata', forms (Vol. I, pp. 75 ff), as well as the identification of a pre 'Classic' African Red Slip Ware (T. S. Chiara, A fabric) series of thin-walled vessels in mid 1st century AD levels. The later ARS series suffer dating amendments to several forms, and the development of several late forms clarified (viz. Flanged Bowl 91). A clearer picture of the coarse wares also emerges, with two main groups clarified – the early and late series of Roman cooking wares (Vol. I, pp. 93 ff), which have four and six separate fabrics respectively. The early series seems to be early–middle 1st century AD and in one of its fabrics (Ware 1), precedes the *Vasi a Patina Cenerognola/ad Orlo Annerito* (African Black Top series) of the mid 1st century AD+. This latter ware would seem to be superseded in the late 4th century AD by the later series of cooking wares (5th–7th centuries AD). Hayes and Riley also outline an early and late series of Roman 'Buff Wares', common in 1st/2nd centuries AD and 4th century AD deposits. Despite a small 2nd century pit group (Vol. IV – House of the Greek Charioteers), and the inclusion of an early 2nd century AD group from the Harvard ASOR Punic Project, it is unfortunate that neither site has yielded firmly dated deposits prior to the Augustan period or in the period between the 2nd and late 4th centuries AD.

3. *Miscellanea*

Several other articles include a (short) introduction to the conservation methods used on site (Rosenberg, Vol. I, pp. 201 ff), the environmental geology of Roman Carthage (Bullard, Vol. II, pp. 3 ff), a critical review of the Polish geophysical work on the site of the Circus (Humphrey, Vol. II, pp. 195 ff), a catalogue of unprovenenced lamps of all periods (of questionable importance in the context of these volumes – Sidebotham, Vol. II, pp. 271 ff) in the Kelsey Museum. Also faunal remains from both sites 1975–6 (Reese, Vol. III, pp. 131 ff), and the palaeothnobotany (Ford and Miller, Vol. IV, pp. 181 ff) are dealt with.

Finally the excavations are put into their physical and historical context by three articles. The first, in Vol. III (pp. 1 ff), looks at the topography of the south-east part of the later Roman town, providing a summary of recent work that would have been better understood with provision of more plans and elevations to illustrate the text. The same is true for Frend's discussion of the Early Christian Church in Carthage (Vol. III, pp. 21 ff), where the list of references to different *Basilicae* could have been illustrated with plans. Vol. IV (pp. 1 ff) provides an article by Clover on the life and economy of St Augustine's Carthage down until the Vandal invasion in 439. In connection with this it is perhaps not surprising that so little can be learnt about the Vandal period from these sites. Being sandwiched between Late Roman and Byzantine levels, and cut up by post-Byzantine disturbance, the picture produced is one of continued occupation slowly devolving into neglect and disrepair. This can be more clearly seen on the British sites (viz. Site F, and l'Ilot d'Amiraute). However, the House of the Greek Charioteers provides an interesting pottery deposit (Vol. I, Ch. 3 – Deposit IV, KO18), which marks the relaying of the Portico mosaic in the latter part of the Vandal occupation. The actual event of the Vandal and Arabic invasions – so traumatic in the historical context – has seen little corresponding evidence in the archaeology.

4. *Conclusion*

These volumes will form a work of reference for other teams in Carthage excavating similar levels. Their publications and conclusions will also help to confirm or modify the points laid down by Michigan. One hopes that future Michigan volumes will be as co-ordinated, and that all loose ends and dating problems are tied together in the final write-up. Despite this these emerge as an important contribution to Mediterranean archaeology, and eminently usable by the archaeologist in the field.

SIMON J. KEAY

DUNBABIN, Katherine M. D. *The mosaics of Roman North Africa: studies in iconography and patronage* (Oxford Monographs in Classical Archaeology). Oxford, Clarendon Press, 1978. xx + 303 pp., 206 figs, 2 maps, 8 pls. £27.50.

The mosaics in Cherchel, Algeria, showing the labours of the countryside are so magnificant that I have always hoped that a great store of equally superb mosaics lay unpublished in North Africa. Now, in a comprehensive description of most of the figured mosaics of the region, the author has proved differently. I cannot forgive Katherine Dunbabin for shattering my illusions, but otherwise her book is excellent.

The subtitle is important if the book is to be appreciated for it is not a general account of the style and development of North African mosaics, nor is it a history of such works, nor yet a technical or art-historical study. It examines in detail the iconography of the figured mosaic pavements and

draws from this examination much information on the people who commissioned the pavements, the reasons why they did so, and the effect that this had on the development of the subjects, and the way that they were represented.

The most readable part of the book lies in the first and last chapters which are discursive additions to the original thesis on the genesis of the African mosaics and their influence on the rest of the Empire. In between lies a closely argued examination of detail with much of the vital argument rather infuriatingly consigned to footnotes. There has obviously been so much to do in collecting and arranging the material for the catalogue, and in summarising the state of research, that the author has had to keep a firm rein on her own ideas. But many times I found myself willing to exchange a paragraph of her summary of published opinion in return for a few of her clear simple sentences on what she actually thought of the problem.

The photographs are well reproduced, though there is a tendency, just as you are following a detailed argument, supported by pictures, for illustration to fail, and references to publications difficult of access to take their place. This breeds the suspicion that illustrations were chosen at least partly from availability, and this suspicion is nowhere denied.

Almost the most important parts of the book, for philistine archaeologists at least, are the detailed notes upholding the Di Vita, early 2nd century, date for the mosaics at Zliten, and removing most of Piazza Armerina firmly out of the Tetrarchy and into the 320s or 330s in line with Carandini. Although it rarely goes into such down-to-earth detail elsewhere this work forms an essential beginning to any further research.

RICHARD REECE

CLARKE, David L. *Analytical archaeology*. Revised by Bob Chapman. 2nd ed. London, Methuen, 1978. xxi + 526 pp., 112 figs. £12.95 hardback, £7.95 paperback.

Devastating critiques of the Establishment tend to suffer one of two fates: total immersion in organised inertia or a peal of well-orchestrated righteous indignation. It was the merit of the first edition of *Analytical archaeology*, published in 1968, that the former proved impossible, the latter ineffectual. In the second edition, the late David Clarke's conceptual steel is sharpened by brevity, increased clarity and the use of Occam's razor to present a weapon of power and penetration.

The leitmotif of the book is clear: 'Archaeologists have concentrated far too much upon increasing the quantity of their data and far too little upon increasing the quality of their conceptual apparatus' (pp. 465–6). In a paragraph whose terseness is matched only by the chill of its logic, Clarke argues that very little of fundamental importance to analytical archaeology has been added since the days of Thomsen, Worsaae and Montelius (p. 10). (The reviser coyly recalls the name of Childe in a footnote.) In terms of the typical trajectory of scientific and other disciplines, archaeology is presently in the 'natural history' or second phase of development (p. 25); a time for definition and conceptualisation, multiple model-building, interspersed with rigorous evaluation of successive theories. It is a measure of the 'de-optimising tendencies' of Clarke's thinking over the 70s that this second phase is now expected to last at least two generations.

The organisation of the second edition follows closely that of the first; an introductory section on the relationship of systems theory to archaeology, the construction of a hierarchy of archaeological grammar (attribute–artefact–assemblage–culture–culture group–techno-complex), with entities defined in terms of space–time systematics; and a third section reviewing potential interpretations and explanations for observed regularities in material culture. Modification of the three propositions governing the structure of the first edition reflects wider changes in the discipline as much as responses to specific criticism. The model of polythetic sets as a basis for entity classification remains essentially unchanged. Systems theory continues to be a key reference point whilst the problem of non-equivalence or archaeological data with mathematically specific systems is openly confronted, if not resolved. Finally, the earlier classic deductional stance is modified by recognition of the validity of induced hypotheses (p. 38). The emicetic dichotomy has been greatly overstressed in methodological debates of the last decade, to the detriment of more fruitful studies.

Clarke's bold aim is to define more rigorously than before the traditional (subjective) entities of Montelius and Childe, within a cybernetics framework. It is perhaps inevitable that definition looms larger than explanation in a hierarchical ordering of entities; yet the lack of explanatory power is a major failing in any attempt at general archaeological theory, unjustifiable despite the complexities of the problem. Binford's (1972) criticism, that for Clarke a culture was normative-additive rather than adaptive, is perhaps an over-simplification (recall the functional relationships between environment, culture systems and subsystems of Chapter 3) but his point remains valid that the explanatory potential of culture as an adaptive network was rarely utilised in first or second edition.

Clarke is ready to acknowledge the model of systems theory and 'polythetic entities' as 'a contemporary approximation' (p. 413), the opening rather than the closing shot of an epic campaign.

Yet to admit this is not to conceal the serious problems which remain in what, by contemporary standards, is a work of unusual rigour. The self-confessed weaknesses cover an alarmingly wide range. The charge of arbitrariness and over-simplification is admitted at various levels (the hierarchy of the system itself, the equilibrium states at cultural and subcultural level, the division of culture systems into subsystems, the levels of subtype/type/type-group). Indeed a fundamental weakness is that the most appropriate form of general system for archaeological data remains unknown (a poor fit is achieved with the semi-Markov system, which requires completeness and complexity of data far beyond what is currently available (pp. 63–5)).

It is paradoxical that the very model which attracted most praise in the first edition requires, in the author's own estimation, far more detailed definition. The nature, structural categories and 'behavioural' characteristics of polythetic sets remain to be elucidated, for current examples are restricted by lack of detailed attribute and artefact analysis.

Perhaps the most critical aspect of archaeological analysis is the differentiation of key, essential and inessential attributes. Far from denying the possibility of achieving this goal, Clarke suggests techniques for defining the inessential variables (usually convergent functional residues). If this problem is critical at the attribute level, the problems of defining cause and effect in complex systems almost defy imagination. Forrester's work on urban dynamics indicates that almost all phenomena highly correlated in time and space are likely to be coincident symptoms, since ultimate causes are buried deep in former system states.

In these three problems lies the crux of Clarke's contribution. It is undeniable that David Clarke has advanced the frontiers of analytical archaeology through lucid and elegant dissection of the most critical contemporary dilemmas. That he has failed to provide solutions is a function of his own intellectual integrity as much as weakness of contemporary theory; in few books is the tendency to oversimplify so effectively debarred. *Analytical archaeology* will doubtless be replaced in time by a synthesis of greater power, predictive capacity and conceptual rigour. Yet it is hard to believe that its future author will not have been stimulated in his task by the work of David Clarke.

JOHN CHAPMAN

WEINSTEIN, R. A. and BOOTH, L. *Collection, use and care of historical photographs.* Nashville, Tenn., American Association for State and Local History, 1977. xiv + 222 pp., illus. $16.00.

There is an urgent need for a well-written and reliable book on the conservation of photographs. The title *Collection, use and care of historical photographs* implies a practical guide. Instead it is a confusing mixture of philosophy and advice with Part One of the book devoted to collection, use and initial care and Part Two to techniques and procedures. Work on any of these topics cannot begin until the identification of photographs has been mastered; for instance, knowing the difference between an albumen and a gelatine print. This important point is not stressed and very few of the otherwise excellent illustrations are dated or identified as to type of photograph.

Part One consists of four sections. Section 1 and 2 are of limited use with much space spent on the significance of photographs (preaching to the converted). Section 3, which would have made a proper beginning to Part One, contains good suggestions about seeking as many sources as possible when collecting photographs. Anyone starting to sort and catalogue a collection should read the sound advice on law and copyright in Section 4.

Part Two needs to be read with caution. Some suggestions are good, some bad and others outright dangerous. For instance, in several places it is advised to use a hypo eliminator, an emulsion hardner or formaldehyde – all of which can be extremely damaging to photographs. There is little on the deterioration of photographs. Yet one cannot begin to care for photographs without first knowing why and how they deteriorate. Section 5 contains two good suggestions – to use Hollinger Permalife paper and envelopes and to physically separate prints and negatives according to type and size. Some of the information about calotypes in Section 6 is wrong and it is misleading to include paper roll film in this same subsection. To the authors' credit, they do emphasise the necessity of duplicate negatives and archival processing and explain clearly the differences between various printing-out papers (POP) and developing-out papers. Section 7 has a useful case history of both black and white and colour photographs taken in 1955. Twenty years later, the colour transparencies had faded to pale magenta images whereas the black and white photographs were in good condition. There is a lesson to be learned from this.

The authors state that their reason for writing the book is to inform the reader of the dangers to photographs. This is a commendable aim for any book. Unfortunately though, one still awaits an authoritative publication on the conservation of photographs.

MARILEE K. PARROTT

LANDELS, J. G. *Engineering in the ancient world* (Ancient Culture and Society, ed. M. I. Finley). London, Chatto and Windus, 1978. 224 pp., 65 figs. £5.50 hardback.

Landels has in this reviewer's opinion produced what is both the best and cheapest study available on classical technology. Since it is a work that has been reviewed by him elsewhere (*JRS*, 69, 1979), the present notice is, after a preliminary general description, confined to points not mentioned in the earlier review. After an introductory chapter on power and energy sources Landels devotes six chapters to six different topics: water supply and engineering, water pumps, cranes and hoists, catapults, ships and sea transport, and land transport. He concludes with two chapters on the progress of theoretical knowledge, the principal classical writers on technology, a bibliography and an index. In his chapter on energy sources Landel underestimates the potential of the proposed late Roman oxpower paddle boat – animal paddle boats *were* built and competed well with oared vessels (his description, p. 16, also fails to take into account the ancient illustrations of the proposed vessel). Similarly his conclusion (p. 29) that Hero's steam turbine could almost certainly not have been used as a practical source of power is wrong, since steam turbines of six horsepower, which performed useful work, were actually built in the 19th century (*v.* Dr Smith's *Dictionary of Greek and Roman bibliography and mythology*, 1890, Vol. 2, p. 437). In his second chapter in discussing (p. 45) means for counteracting pressure in 'inverted siphons' he fails to mention the very effective solution adopted by the Romans at Lincoln where the terracotta pipes were encased in concrete. The pipes at Lincoln may have been required to withstand a pressure of 43 lb/in^2 or 3 kg/cm^2. In discussing the means by which water was distributed from the supply point to the consumers he appears to be unaware of the archaeological evidence (the *castellum divisiorum* at Arles should certainly have been mentioned). It is incorrect to say, p. 47, that reliable spring loading would have been difficult to achieve with the materials available, since spring steel in fact found a very widespread application for locks in the Roman period. The chapter on catapults will need revision in the light of the surprising and ever-growing increase in the amount of archaeological material. On p. 181 is the extraordinary statement that water seems to have been the most commonly used lubricant in antiquity. The Romans certainly used animal lard as axle grease – and *axungia*, the word for it, was jokingly applied to the lard that formed part of the rations issued to the soldiers at Vindolanda.

These minor points show how wide is the range of Landels' book. In fact the only criticism of substance is that it falls just short of being truly comprehensive in that it does not include a section on olive mills and presses which certainly should have fallen within the scope of the book.

MARK HASSALL

HALL, A. R. and SMITH, N. (*eds*). *History of technology*, first annual volume. London, Mansell, 1976. 186 pp., 27 figs. £9.75.

This collection includes eight essays by various authors on the history of technology, of which two are historiographical and methodological, while the remaining six deal with specific aspects of the subject ranging from Roman water engineering by Norman Smith to Aluminium by Marie Boas Hall. This reviewer found these six chapters of absorbing interest (the theoretical contributions less so) but will confine his attention to Smith's contribution upon which alone he is qualified to speak.

Norman Smith is particularly concerned with the use the Romans made of pressure-fed water supplies, usually referred to as 'inverted siphons'. He shows that two assumptions made by writers on this subject in the past – that the Romans hardly used pressure pipe lines because they were worried about bursts and that their occasional decision to use them in preference to aquaducts was not dictated by any logical consideration – are both wrong. Inverted siphons in fact were not uncommonly built and the depth of the obstacle to be crossed was the deciding factor when this solution was preferred to the alternative of constructing an aquaduct, something over 150 ft high being regarded as the limit for a bridge (p. 66). Among other points of interest that emerge is the sheer quantity of lead required for siphon pipes – between 10,000 and 15,000 *tons* of lead for the nine siphons used on the Lyons aquaduct. On p. 65 he dismisses the idea that tables which related such parameters as velocity, fall, length of pipe and pipe diameter, were used perhaps unjustifiably since tables giving just these sort of relations were available to military engineers engaged in making catapults. This quibble apart, Norman Smith's conclusions are compelling and there is probably a moral here, since time and again historians of ancient technology seem to repeat old conclusions and verdicts without looking afresh at the growing body of archaeological evidence. Thus Smith himself accepts the 'fact' (p. 47) that though 'the Romans knew how to use water power (i.e. for milling) they chose not to, at least not to any extent and then only at a late date'. This is one field in which the archaeological evidence could well

be surveyed afresh, with the *caveat* that for every mill attested many could well have existed that have not been found – the Domesday survey shows that there were 500 mills in Norfolk and Suffolk alone – yet how many of these are attested archaeologically?

MARK HASSALL

MAJOR, J. K. *Animal-powered engines.* London, Batsford, 1978. 168 pp., 110 illus. £5.95 hardback.

Though this attractive book with its useful gazetteer had been written with industrial archaeologists in mind, it will also claim the attention of all medievalists and Romanists who have an interest in technology. The remarks that follow are written very much from the point of view of the latter.

The Romans used animal power for transport, ploughing, threshing, milling, raising water, and, in north-west Gaul, reaping; at least one 4th century Romany toyed with the idea of using animals to power a paddle boat; and if animal power is interpreted to include the energy supplied by human beings, then 'animal-powered' treadmills were also used for dockyard cranes. This technology was inherited by medieval engineers. With the coming of the industrial revolution, water power (first used for milling in classical times) and then steam power (some experimentation but no industrial applications in the classical period) were used for a whole range of industrial processes. However, it is often forgotten that *animal* power remained the norm for agricultural machinery until the last quarter of the 19th century, when steam was introduced to a limited extent, and only in the present century has this source of energy really given way to another, the internal combustion engine.

J. Kenneth Major's book shows clearly the whole range of uses to which animal power was put in the medieval and post-medieval period, from turnspits to dockyard cranes (though one aspect, of interest to this reviewer, animal-powered paddle boats is omitted by him). He also shows how efficient some of these animal- and man-powered machines could be: the Beverly Minster treadwheel crane for example, powered by a single man, can easily lift ¼ ton, while the Luneberg crane actually lifted a locomotive! This is a book then, that should delight the champions of 'alternative technology' whether ancient or modern.

MARK HASSALL

Anthropological literature: an index to periodical articles and essays. Compiled by Tozzer Library, Peabody Museum of Archaeology and Ethnology, Harvard University, Pleasantville, New York, 1979. Vol. I, no. 1, Winter 1979. Unpaginated. Yearly subscription for four issues $38.00 for institutions; $28.00 for individuals.

Any librarian welcomes a new index, and hopes that it will make knowledge more readily accessible, and that it will actually be used. The new publication compiled by the Tozzer Library sets out to provide a current index to its own holdings, not only of periodicals but also of colloquia, Festschriften and collected works. There is, at this stage, no list of the periodicals to be indexed regularly, but the back cover blurb says that more than 900 different publications are covered in the first issue.

The editorial sets out the criteria used for the selection of articles and archaeologists will note that it is intended to cover 'archaeology up to Roman times for relevant parts of the world, except for the Near East, articles up to Islamic times.' For the USA 'historical archaeology' is to be included, but for the rest of the world 'only if it includes transitional data from the prehistoric period or represents the termination of a native sequence. Industrial archaeology is not indexed.'

The entries are grouped in the following broad sections: Cultural social; Archaeology; Biological physical; Linguistics; General method/theory. In the first volume there are 670 entries in the section on archaeology, arranged in one long list alphabetically of author. It is, however, possible to make some selection from this over-all list by way of subject indexes at the end: Archaeological site and culture index; Ethnic and linguistic group index; Geographic index.

The first only contains 60 entries of which not more than 10 are sites; the geographic index is fuller, but to isolate the entries in the main sections which are of particular interest to the reader will inevitably be a tiresome process of remembering and locating numbers. It is here that comparison with the existing index in this field of work is inevitable. The *Anthropological Index* published by the Royal Anthropological Institute now covers current periodicals in the Museum of Mankind Library, incorporating the former Royal Anthropological Institute Library. Its layout combines the concepts of geographical area and subject matter; that is to say that the entries are grouped geographically, but each geographical section is divided, where appropriate, under the following headings: General, Physical anthropology; Archaeology; Cultural anthropology; Ethnography; Linguistics. It is thus possible for the archaeologist to glance down all the articles collected on the archaeology of, say, South America or Scandinavia without dotting to and fro from an index at the back.

One is bound to ask, therefore, if the new publication can supplement the older index in any useful way. Only the section on archaeology has been examined in detail by the reviewer, but some of the points made apply throughout. The *Anthropological Index* publishes a list of the periodicals held in the Museum of Mankind Library and indicates which are regularly indexed; a summary of additions and amendments appear in the first part of each yearly volume. As has been said, no such list yet exists for *Anthropological Literature*, but a careful examination of the entries in the Archaeology section show that although a number of identical periodicals are indexed the new publication covers a number of journals and series not included in the old, often more specifically archaeological in content. Many are, of course, regional American, such as the *Quarterly Bulletin of the Archaeological Society of Virginia* or *Pipeline Archaeology*, published by the University of Alaska. But there are a number of European and British periodicals and series not indexed in the British publication, i.e. *Quaternaria, Palaeohistoria, Current Archaeology, Somerset Levels, BAR Reports.* On the other hand *Anthropological Index* includes much material not apparently covered in *Anthropological Literature.*

The extension of indexing to symposia and collected works might be of value. Unfortunately the method used seem self-defeating. Reference is given to articles is books under the author of the article, and only the title, place of publication, publisher, and date of the book is given, no editor or author nor, in the case of Festschriften, person honoured. Thus we find:

1222 Frisbie, Theodore, R.
High status burials in the greater Southwest: an interpretative synthesis. Across the Chichimec sea. Carbondale, Ill.: Southern Illinois University Press, c 1978, pp. 202–207.

Unless your library has a title as well as an author index, or unless you know that *Across the Chichimec sea* is the title of papers in honour of J. Charles Kelley, edited by Carol L. Riley and Basil C. Hedrick, there is no way to locate this article. Oddly, too, though articles with double or triple authorship file under the first author, articles with multiple authors are indexed only under the title of the article, thus:

1088 Celtic vitrified forts: implications of a chemical-petrological study of glasses and source rocks.
E. Youngblood et al. Journal of archaeological science. London: V. 5, n. 2, 1978, pp. 99–121.

The lay-out is pleasant and the type easy to read; it is possible to subscribe for each section separately, presumably together with complete indexes. For users of the Tozzer Library it will undoubtedly prove a useful research tool; for those working in other libraries its value is more limited.

HEATHER BELL

MUCKELROY, Keith. *Maritime archaeology* (New Studies in Archaeology). Cambridge, Cambridge University Press, 1978. x + 270 pp., 47 figs, 61 pls., 12 tables. £16.00 hardback, £4.95 paperback.

For many people shipwrecks mean sunken treasure and glamorous adventure on the high seas, culminating in a death-struggle between 'hard-hat' diver and Hollywood octopus. The sensationalism of the last decades is the seemingly immortal *bête noire* of the deeps that still surfaces regularly to overshadow the more serious work in maritime archaeology. Moreover, the disciplined side of the coin has been very much younger brother to land archaeology and something of a late developer, having its adolescent boom in growth after the wartime invention and development of the aqualung. Its problems then were primarily physical, leaving little time for theoretical development, but many of the technical skills have now been mastered: it is catching up fast with developments on land and, as this book shows, has reached maturity.

In the first chapter, the author sets out to define maritime archaeology ('the scientific study of the material remains of man and his activities on the sea') and to provide a new theoretical framework for this subdiscipline of archaeology. It is distinguished from the allied fields of nautical archaeology (boat and ship finds in a totally non-maritime context, e.g. grave finds) and archaeology underwater (activities concerned directly with maritime activities, e.g. submerged land sites), and followed by a brief historical review of the developments of maritime archaeology to put its academic immaturity and present condition into perspective.

Chapter 2 gives an excellent description of the constraints of work underwater: its organisation, and the psychological and physical problems and advantages involved – essential reading for critics of the standards achieved or standards possible. Chapter 3 presents nine topics to illustrate the area of research and demonstrate its significance: Mediterranean ship-building in classical times, Mediterranean trade in pre-classical and classical times, early Mediterranean harbours, ships of the early medieval period in north-west Europe, post-medieval construction, the Spanish Armada, the expansion of

Europe in the 16th–19th centuries, the annexation of the New World, and navigational instruments. Chapter 4, ends Part One with several areas of research for the future – of particular interest is the potential of deep-water archaeology.

The condensation of these four chapters does involve inevitable generalisations and gaps in coverage, but to some extent they form merely a preamble to the main purpose of the book – namely the presentation in Part Two of a general theory of maritime archaeology: modes of data analysis (with particular reference to the shipwreck, Chapter 5), the ship as basic unit of study (Chapter 6) and ultimate research objectives (Chapter 7) with a postscript touching on some of the implications of these ideas for maritime archaeology in the future. To the land archaeologist much of the chapter on systems/trend/numerical analysis will be familiar but interesting as a valuable translation of such applications to maritime contexts, and though at times its appears disproportionally detailed, it will be of definite value to the diver as a springboard for further thought and experimentation.

Most of the examples cited are in British and Irish waters, indicating the personal nature of much of the book, and disappointing the reader interested in learning about methodology elsewhere. Some assessment of the analytical standards achieved to-date in, for example, the Mediterranean, the United States or Australia would have been useful, along with a glossary of technical terms for the non-specialist. The section on data analysis (pp. 207–13) should perhaps have been either reduced considerably or given fuller and adequate explanation and confusion arises on p. 78 where the word vessel is used to mean both container and ship. The statement on p. 219 that no discussion of the potential for research into fishing vessels and their economic role is possible due to the absence of such remains ignores many of the important Ijsselmeer finds (referred to as Zuider Zee and largely excluded). The illustrations are of a very high standard (the underwater photographs better than those taken on land!).

This book, then, is not a complete manual nor a summary of every important excavation undertaken, nor a treasure-hunter's guide to marine wealth. Nor does it remedy one of the inhibitors of such detailed site analysis – money. It does, however, provide an extremely useful synthesis of recent developments and intelligently states the problems that maritime archaeology should be concerned with, and is to be recommended to specialist, non-specialist and sceptic alike as an up-to-date consideration of the potential of maritime archaeology: that the slovenly or below standard work of the past associated with the mistaken assumption that an underwater site must be unstratified or of little importance is no longer justifiable.

MARK REDKNAP

BARKER, Philip. *Techniques of archaeological excavation.* London, Batsford, 1977. 279 pp., 86 illus. £8.95 hardback, £4.75 paperback.

FOWLER, Peter J. *Approaches to archaeology,* London, A. and C. Black, 1977. 203 pp., 33 figs, 22 pls. £6.50.

The titles might imply that Barker's is the particular and Fowler's the general study, but although the authors' aims and executions differ appropriately, their books do complement one another. For each is a statement of accumulated experience of the substantial changes in British archaeological practice in the 60s and 70s: Fowler's explicitly so, commissioned as 'a successor or sequel' to Stuart Piggott's *Approach to archaeology* (1959). They are, of course, personal statements, as the authors remark; but it seems fair, to one writing on the first day of 1980, to review what these leading practitioners have to say as the currently received wisdom of the last two decades' work.

To Fowler, excavation is a rather dirty word, if I may so put it. He prefers 'Buried Archaeology' as a chapter heading. He is belabouring the misconception that 'archaeology' equals 'digging', a view by no means dead, and not confined to uninformed popular opinion: I have heard tell of one who would, and may still, arrive to teach his extra-mural class wearing his muddy boots, to demonstrate the priority of 'still digging'. Fowler's chapter on Topographical Archaeology emphasises the revived interest in fieldwork and the appreciation of the importance of the whole landscape in archaeological studies. Despite his experience in this aspect, it is not the easiest of his chapters to read, partly because of sentences burdened with parentheses and qualifying subclauses, partly because of such unhappy expressions as 'a temporal, physically-surviving landscape context' (p. 51); but then, the ongoing archaeological situation is a child of its time! Contrast, however, his stimulating first chapter, Approaching Archaeology, which is very readable, with some choice quotations on the relationship of archaeology and history (p. 19).

To return to the substance: no longer may we think of archaeological sites as 'dots on an otherwise blank map'. Barker makes essentially the same points in his necessarily briefer chapter on Fieldwork. They have been brought home to us by several factors: enormously increased coverage

from aerial photography; the realisation that agriculture, gravel extraction and motorways destroy as much as, if not more than, urban developers; increasing, though still inadequate, co-operation with documentary historians; the acceptance that standing buildings are legitimate subjects for archaeological record; and the fact that, whereas required standards of excavation are now far more demanding than in the innocent days of a trench across the ramparts and a lung-full of fresh Sunday air, field survey can still produce useful results with more limited means.

Those in doubt about the demands of excavating had better sit down and read Barker's 'Life history of a post-hole' (pp. 83–7), which should make them think twice before picking up a trowel, if they have not done so before. While those who have little or no practical knowledge of archaeology could hardly fail to profit greatly from reading Barker, and although he modestly disclaims his book to be the 'Compleat Excavator', those already familiar with the process of excavation can draw many lessons from the wealth of his experience and the fruits of his hard thinking: witness, for example, his discussion of the difficulties involved in dealing with the faint traces of timber buildings and occupation in the topmost levels or even (p. 129) in the ploughsoil of a site, and of the agonies of deciding what has to be sacrificed in a salvage excavation (Chapter 7). He is, of course, polemically dedicated to the area excavation, and produces disturbing examples from his own experience of how trench digging can result in as many casualties, archaeologically speaking, as trench warfare. Not all will agree, however, that he has done full justice to the arguments, indeed necessities, for modern sampling strategies for archaeological sites.

His approach to some of the universal problems of archaeological evidence, and to the ideas and assumptions which are the basis of our excavation practice, has a rigour all the more welcome for the accompanying realisation of the frequent difficulties of putting precept into practice where the unexpected always, paradoxically, has to be expected (cf. p. 140), and of the temptations suffered, while trying to make sense of what we have found, to play down what does not fit into a logical and coherent structure. This is well illustrated by his excellent discussion of what the concepts of *termini ante* and *post quos* involve (p. 193), and in his advocacy of lateral thinking (p. 189), what philosophers would describe as a Popperian approach, in evaluating and interpreting evidence. Always to question, to be prepared to admit that we were wrong, never to be satisfied with a first or (worse) preconceived interpretation, however attractive and convenient, is not always easy, given the pressures of getting on with the job. The job will not be worth doing, however, if the mind is closed to possible avenues of discovery for, as Barker reminds us, each excavation is an unrepeatable experiment. If excavation is destruction, and excavation without recording and publication is vandalism, excavation blinded by preconceptions is fraudulent conversion of our heritage.

Running through both books are references, explicit and implicit, to two of the moral impasses which archaeologists have to face. Despite the massive lip-service paid to the supposed objectivity of the 'facts' of the archaeological record, the degree to which the subjective interferes with them, from the first scrape of the trowel to the computer input (and indeed, before and after), is frightening. Does the elegance of a Harris matrix, for example, encourage us to resolve or conveniently to disregard the many uncertain stratigraphical relationships which even the best excavator cannot help but find?

The other impasse is presented by the destruction of archaeological evidence, itself only a partial record of man's past activities, at a rate too fast to allow proper examination. We now have to consider much more carefully than has been past practice not only how, but why a particular site should be excavated. Fowler (p. 74 ff) gives us a delightful, or should I say disturbing, anthology of stated reasons for particular excavations (culled from those published and, as he pointedly remarks, thereby excluding a very large number from the evaluation). We can orient ourselves to problems. To emphasise the overall problem, however, we might compare the excavations by Barker himself, one of the founders of Rescue, of Wroxeter at a few centimetres each year, with the removal of cubic kilometres of virtually or completely unrecorded archaeological layers from the centres of historic towns and in the path of rural motorways, ploughs and subsoilers (cf. Barker, pp. 37–41 and 122–7).

These are real dilemmas; it is of no use to hope in some Panglossian way that the millennium will come when such opposites will be reconciled, particularly now that economic recession encumbers us. With the hindsight available to a reviewer late with his copy, it seems sadly ironic that in 1976 Fowler could write (p. 166) 'more money, more jobs, presumably more archaeology' even though, as he also noted, rising wages and inflation were already eroding the value of increased government grants. In this context, his interesting first and last chapters are of particular value in what they have to say about the place of archaeology in society. There is an enormously greater public interest in the subject than there was 20 years ago. It is not adequately satisfied by a discipline which has during the same period become increasingly introverted, in Fowler's opinion. One might add, that if treasure-looters abound, the auto-erotic professional should blame himself for failing to communicate what archaeology really is.

If archaeology is to receive public money, it must feed the public interest. It must publish; and one hopes that the space and detail which both authors devote to this obligation will have at least two

effects: that of making clear that processing, analysis and publication take longer and cost more than the original excavation, and are essential; and that of making it unnecessary in the future to produce indictments like Fowler's Fig. 6.4, a histogram showing 1,433 state-financed excavations between 1961 and 1972, and only 450 reports, many of them interim.

Out of this public interest, archaeology is going to need all the part-time help it can get: one suspects that Fowler would now say this even more strongly than he does on p. 169. And whether part-time or full-time, the standards must be professional. Archaeology may be fun; it is also difficult. Neither of these books makes it sound easier than it is; and as so often, reading discussions of the problems of archaeological evidence and its interpretation, one reflects that all we shall ever do is to extend our appreciation of how much we shall never know for certain. Nevertheless, if as Isaiah Berlin tells us the function of a moral philosopher is not to tell a man what his choice should be, but to make clear to him the implications of his possible courses of action, then we have plenty of archaeological philosophy in both these books. Some of us may realise how far we have fallen short of the best which could be done in what will never be the best of all possible worlds. Some us may do better in future.

T. F. C. BLAGG

VITA-FINZI, Claudio. *Archaeological sites in their setting* (Peoples and Places 90). London, Thames and Hudson, 1978. 176 pp., 103 pls. £7.50.

This book, Volume 90 in the Thames & Hudson series Peoples and Places, is concerned with environmental archaeology. The book focuses on the physical conditions of the landscape leaving aside the discussion of floral and faunal evidence which has received a certain amount of attention in the last decade.

Vita-Finzi outlines many aspects of the earth sciences which can be of use to the archaeologist attempting to understand the landscape contemporary with a site. While techniques, sources of information, and some of their limitations are examined, this book is not a 'teach yourself earth science' for archaeologists. However, Vita-Finzi does point out some areas, for example soil analysis, where much useful preliminary data can be obtained without very specialised knowledge or training. The topics surveyed include: dating techniques, geological agencies, the evolution of land surfaces and shorelines as well as the usefulness of information from documentary sources. The ways in which these can be of value to the archaeologist are illustrated by examples drawn mainly from the author's field experience in many parts of the world. Throughout the book Vita-Finzi emphasises the importance of building up a picture of the local environment of a site or group of sites and postponing the formulation of broader generalisations, for example climatic change.

The text is written in a style which is usually clear and readable, although it contains an historical error towards the end of the book. Here when referring to the victory of Augustus at Actium, Caesar has been substituted for Antony. Cleopatra must have been surprised! The numerous figures and photographs are useful additions to the text providing easy reference for the location and type of terrain discussed.

This book summarises the type of results which can be achieved by collaboration between archaeologists and earth scientists, and also helps to dispel some of the mystique which can surround specialists. This work should help archaeologists to formulate questions appropriate to physiographic material and to better understand the strengths and weaknesses of the data earth scientists have presented them with.

W. McISAAC

GREEN, D., HASELGROVE, C. and SPRIGGS, M. (*eds*). *Social organisation and settlement: contributions to anthropology, archaeology and geography* (BAR Int Series (Suppl), 47.) 2 vols. Oxford, British Archaeological Reports, 1978. xxvi + 519 pp., figs. £11.50.

This book, which consists of 25 papers, represents the proceedings of the interdisciplinary conference held in Cambridge in 1977. The papers are grouped in four sections on Boundaries, Ecological perspectives, Settlement patterns and State formation, each of which is introduced by the editors. The whole volume is prefaced by a valuable discussion of the problems of interdisciplinary work from the viewpoint of the geographer (Green) and the archaeologist (Haselgrove), whilst Chisholm and Lewis discuss the main points raised by the contributions in each of the volumes. Lewis's contribution is itself an incisive review of much value.

It is impossible to discuss all the contributions, but some stand out with ideas of much interest presented. Foremost amongst these are those by Renfrew, Bayliss-Smith, Fletcher, and Hillier *et al.* These, and the volume as a whole, are very stimulating but leave the reader with doubts. First, there is doubt about whether these ideas are always applicable to purely archaeological data. The second related doubt is whether we as archaeologists are being drawn away from the problems posed by our material evidence by the methods developed by the disciplines of anthropology and geography which have data more suitable for answering the currently fashionable problems. Several times I was left with the impression that archaeologists ought to sort out their own methods before borrowing methods, or comparing their results with other disciplines. Finally the fundamentally important point that recurs, is that there is no simple correlation between settlement patterns and social organisations emphasises the need for more basic studies like that presented by Roberts upon which new generalisations can be based.

This is an important volume which provides much of interest to inspire and encourage new work. It is however a pity that some of the jargon could not have been removed, and some of the more glaring misprints removed (e.g. p. 95, fig. 2; p. 407 top).

MARTIN MILLETT

FLEMING, Stuart J. *Authenticity in art – the scientific detection of forgery.* London and Bristol, The Institute of Physics, 1975. 164 pp., illus. n.p.

The detection of forgeries in works of art has long been considered the task of art historians and scholars. These judgements were usually based on stylistic evidence. However, Dr Fleming in his book points out that this approach can be dangerous. *Authenticity in art* was written to provide the reader with a good overview of the modern scientific techniques that can be used in the detection of forgeries in various types of art objects. The history of forgery goes back into ancient times and sometimes the question of authenticity can only be solved using the most sophisticated scientific methods. The author avoids the usual anecdotal approach to the subject and concentrates on the laboratory analysis.

The book is divided into three main topics: paintings, ceramics and metals. The section on painting concentrates on techniques used in pigment analysis such as neutron activation and mass spectrometry. Also included is the interesting affair of the faked 'Vermeers' produced by van Meegeren which was not finally decided until the development of a new radioactive dating technique in 1968. The chapter on ceramics is concerned mainly with the use of thermoluminescence as an aid in age determination. The author discusses the analysis of Tang Dynasty funerary ceramics in particular. The last section on metals deals primarily with the counterfeiting of coinage. This is an area in which forgery has long been practised because of the major financial gain involved.

Authenticity in art is a book which should be read by everyone interested in the field of art. Although one would need a scientific background in order to fully understand the more advanced techniques described by Dr Fleming, this book can be of value to both the professional and general reader. There are numerous illustrations which greatly enhance the text. Finally, an extensive bibliography is included for those who wish to pursue this fascinating topic.

MARILYN LENZ

Nordic Committee of the Humanities Research Council: The Archaeological Sub-committee for Co-operation between Archaeology and the Natural Sciences. *Natural science in archaeology in Denmark, Finland, Iceland, Norway and Sweden: a report to the European Science Foundation Committee for Archaeology.* Copenhagen. The Nordic Committee of Humanities Research Councils, 1978. 92 pp., n.p.

This publication is a report to the European Science Foundation Committee for Archaeology. It gives a list of institutions which are involved in scientific work related to archaeology in the countries mentioned; the list may not be complete for some scientists and institutions did not respond to the committee's enquiries, for fear of being overwhelmed by archaeologists' requests for aid – a familiar story.

The report is, however, much more than a list. It goes on to discuss all the aspects of science – survey, analysis of excavated material of all sorts, and even training – as they are applied to archaeology. It brings out repeatedly the 'conflicts between the archaeologists wanting "service" and the institution's or person's own wishes to have more influence in the layout of a common research programme'. Another point that will be very familiar to archaeological scientists in the United Kingdom is 'that while it may be possible to train archaeologists – or for that matter anybody – to determine

pollen, macrofossils and diatoms it is of vital importance that diagrams and results are *interpreted* by someone with a proper botanical and statistical training'. The same point is reiterated for palaeozoology. In dealing with analytical methods it is emphasised that standards for archaeological materials must be established and maintained.

The report is full of interest and sound horse-sense and deserves careful study by all involved in the planning and execution of scientific applications to archaeology. If it had been available when the Ancient Monuments Rescue Committee produced its report on 'Scientific methods in the study of archaeological material' some of the points made there could have been considerably strengthened. A contrast between the two reports (which were produced for quite different reasons) is that the British one was largely dominated by conservation, whereas in the Scandinavian one this subject plays only a subordinate part. This perhaps reflects the more limited facilities available there in this field, and makes the point that a report of this kind not only shows where centres of expertise are to be found, but also that coverage of the various scientific disciplines is uneven, both within the individual countries and through the region as a whole.

GEOFFREY DIMBLEBY

RIXON, A. E. *Fossil animal remains: their preparation and conservation.* London, The Athlone Press, 1976. vi + 304 pp., 35 fig, 13 pls. £5.25.

The work in a palaeontological laboratory involves a broad series of operations, ranging from the preparation and conservation of fossils to their final mounting for museum exhibition. It is a challenging and involved process which Mr Rixon carefully and comprehensively relates. In a pleasant and rapid style he begins by describing the theory and application involved in the consolidation and repair of specimens, with particular attention to the adhesives and solutions to be used. He then considers the collecting and treatment in the field with a warning against haphazard amateur collecting. He next discusses the necessary tools and techniques for the removal and lifting of fossils from the containing matrix, as well as common-sense procedures (those most easily forgotten!) such as photographing, labelling, and the use of reversible materials.

In the laboratory, the fossil must be removed or 'developed' from the matrix, and Mr Rixon describes the use of mechanical tools (including the Burgess Speed Engravers and the S. S. White Industrial Airbrasive) and chemical procedures (dilute glacial acetic acid appears to be the best choice as it does not dissolve phosphates). He then discusses the mounting of specimens and the problems encountered with specimen shapes, sizes, and eventual location in a museum display. The details of moulding and casting techniques, along with a suggested wide choice of resins, pastes, or plaster, are useful in the event one needs to make replicas. The last two chapters itemise necessary laboratory equipment and chemicals, and provide important information on the behaviour and properties of recommended materials. Throughout his book Mr Rixon emphasises the necessity for care and safety when using various instruments and chemicals, and this is a factor which cannot be overstated. In both the field and in the laboratory, one must observe safety measures and have adequate supervision. The toxicity and hazards of chemicals to both man and environment must not be taken lightly.

Finally, the numerous figures and drawings help to elucidate the methods and materials used in treatment. The two appendices, Special tools and techniques and Materials, manufacturers, suppliers, also offer valuable practical and reference information.

One editorial comment concerning source material: p. 15, *Larney* is referred to as 'he'. 'Judith' is her first name.

In the preface Mr Rixon states that his book 'is intended as a practial manual', and that it is. He is to be congratulated on this thorough and clear presentation of techniques, equipment, and materials. His depth of knowledge and experience as Senior Experimental Officer in the Palaeontology Laboratory of the British Museum (Natural History) are evident; and his up-to-date survey will prove most useful and interesting to specialists in palaeontology, conservation, and to general readers in archaeology as well.

STEPHEN P. KOOB

DAVIDSON, D. A. and SHACKLEY, M. L. (*eds*). *Geoarchaeology: earth science and the past.* London, Duckworth, 1976. x + 408 pp., illus. £14.00.

This volume is the outcome of a symposium on 'sediments in archaeology' held in 1973. The revised title certainly covers the contents rather better than the original since soils and their biological content are included among the papers. The common concern of the participants, as stated by the editors, is 'the reconstruction of former environments using specialist techniques' and the geographical areas covered range from the British Isles and Europe to Syria and Iran, Mexico and South Africa.

The techniques discussed in the first section come entirely from the physical sciences and are mainly those applicable to sediments and rocks found on archaeological sites such as petrographic examination (Catt and Weir), chemical analyses (Proudfoot), granulometrical analysis (Laville) and the magnetic properties of sediments (Graham). The spectrographic techniques described by Williams and Jenkins are applied to potsherds in order to locate possible source outcrops and sediments. Finally, two papers in this section are concerned with sampling procedures and recording (Shackley and Fedele). The rest of the volume is concerned with presentation of results from a heterogeneous collection of sites and the papers are divided into those concerned with sites associated with coastal and lacustrine strandlines and those in so-called 'terrestrial environments'. The final section is called 'biological sediments' with papers by Dimbleby, Jones, Buckland and Evans but, in fact, mostly deals with biological remains extracted from mineral sediments, except for Jones' paper on Mesolithic activities on the North York Moors detected from peat, which could be classified as a sediment.

There is no doubt that such hybrid studies as are exemplified in this book are playing an increasingly important part in archaeological interpretation and words such as geoarchaeology, palaeoarchaeology, archaeobotany, and zooarchaeology are familiar words on symposia programmes and textbooks. One can only hope that fully integrated disciplines will emerge and will be vigorous F_1 hybrids and not merely inherit the feeble aspects of both parents. One important way of avoiding this would be closer co-operation and understanding between the excavator and the 'specialist', or preferably that they are one and the same person. That this is not always the case emerged clearly from some of the papers and the discussions following them. The length of laboratory time consumed by analyses of sediments, pollen or invertebrates is often longer than the whole excavation season and the analyst as much as the archaeologist wishes to see results which can be interpreted in terms of past environments or human activity on the site and which form an integral part of the final report. The further need for specialists analysing material from a site to be aware of each other's existence before, rather than after, publication so that their results can be integrated, too, was stressed by a number of workers at the conference. Equally, a specialist arriving on a site for half a day to collect samples cannot appreciate the complexities of the excavation and difficulties of the archaeologist whose understanding of the stratigraphy may well change in the light of further work after collection of the samples.

The difficulties which arise when techniques developed by one science are applied in another context were stressed by Catt and Weir who point out that petrographic work on sediments is still at the stage where more fundamental research is needed before processes and their effects are fully understood so that archaeologists are often asking questions to which there is at present no firm answer. The extension of the frontiers of knowledge in other disciplines, however, may well come from excavation since it is in such fieldwork that sections and exposures, often on a large scale, are uncovered and made available for study. Collection of samples outside the confines of the site may also be necessary in order to have a control against which to compare the special conditions produced by human activities.

Many specialists complain that archaeologists request a blanket analysis of sediments without formulating questions to be answered by the work, but the lack of guidelines as to what information is extractable from archaeological deposits, has made this request seem unreasonable to the archaeologist. The papers in *Geoarchaeology* go a long way to help with this problem but it is interesting to see that in many cases the participants have set themselves a broad problem rather than specific questions. Thus in the coastal section, I. A. Morrison is concerned with Holocene sea-level changes over a wide area of the western seaboard of Europe to see whether a pattern of ^{14}C dated marine transgressions and regressions can be established and Jardine and A. Morrison relate such changes to man's occupation and economy along the emerging coastal areas of south-western Scotland. The papers on the settlement pattern of the coastal area of Foggia (Delano Smith) and the sediments at Tlapacoya, a lakeside site in the basin of Mexico (Limbrey) were both problem-orientated in broad terms, the first to study the recent sedimentary history of the coastlands in order to account for the prehistoric and historic settlement pattern of the Tavoliere as a whole and the second to establish the sequence of lake level fluctuations which might be interpreted in climatic terms.

Likewise, in the terrestrial section several of the authors were working on a broad canvas related to settlement patterns, such as Bintliff on southern Greece. The necessity of recognising aggradation and erosion due to geomorphological processes when assessing numbers of sites and in interpretation of the stratigraphy of tells in semi-arid areas is covered by A. and M. J. Kirkby and Davidson. But some authors were concerned with the interpretation of sediments on one main site; Dibsi Faraj in Syria (Wilkinson), Die Kelders Cave in Cape Province, South Africa (Tankard and Schweitzer) and Welton-le-Wold, Lincolnshire (Straw). Of these, the last site posed the most direct question: were the handaxes and mammalian bones derived or contemporary with the deposit in which they were found? This theme was also taken up by Wymer and Cheetham in connection with Palaeolithic industries in fluviatile deposits in Southern Britain.

On the whole, however, the questions which are answered by these case studies are of a broad kind: what is likely to be the result if a study is made of sediments in relation to archaeological sites in an area; have geomorphic processes disturbed the recognition of settlement patterns and resource potential studies; can climatic interpretations be extracted from sediment analyses?

Is it only in biological work that we can postulate narrower questions such as 'was this sewer in York constructed principally as a freshwater overflow from a bath-house, as a storm drain or as a foul-water sewer' and hope to have them answered by a study of pollen or insects? Perhaps it was only the selection of papers for this symposium which makes it appear so.

In a book with this title one would hope to gain some idea of the general applicability of the methods and results but few authors consider this matter. One of the factors which militates against an assessment of the universality of the parameters is the lack of a standardised presentation of results. Even in cave sedimentology which has a respectable antiquity of practice no agreed procedure has emerged so that even caves within the same valley cannot be compared in detail. Although some efforts are being made in this direction, particularly in quantification, there is still much to criticise as shown by some authors in a recent volume on caves in the World Archaeology series (cf. Collcutt and Deacon, 1979, Vol. 10, No. 3).

JOAN SHELDON

FLETCHER, John (*ed.*). *Dendrochronology in Europe: principles, interpretations and applications to archaeology and history* (National Maritime Museum Archaeological Series 4) (British Archaeological Reports International Series 51) (Research Laboratory for Archaeology and History, Oxford University Publications 2). Oxford, BAR, 1971. viii + 356 pp., numerous line drawings and photographs. £8.50.

This volume, the fourth in the Archaeological series published by the National Maritime Museum, is more than just the proceedings of the First International Symposium on Dendrochronology, held at Greenwich in 1977; a number of papers have been added – some new, some (like Huber's classic 1948 paper) already published, but included to give the book greater value as a reference work. The book is divided into two sections, the first dealing with the establishment of tree ring chronologies in various areas of Northern and Central Europe and the second – of greater interest to archaeologists – on the application of these chronologies to archaeological problems.

Though many of the papers in the first section are too specialised for the average archaeologist, they provide an excellent opportunity for those interested in the development of dendrochronology to read some seminal papers which were originally published in German, Germany being generally held to be the nursery where tree ring chronologies were first applied to archaeological problems.

Almost every paper in the second section offers something of interest: some papers concern well-known sites, for example Somerset Levels (Coles, Orme and Morgan) and the London waterfront (Morgan and Schofield), the latter now producing fascinating results. Other papers concern lesser-known sites: Dr Eckstein's paper on Hedeby for example or Bräker on the recent work being done on the lacustrine sites of Neuchatel. For medievalists, there is the chance to compare Fletcher and Bauch's approach to the problem of dating panel paintings.

With the publication of this volume, dendrochronology has come of age in Britain. The range of papers and their individual quality make this an invaluable reference book for all archaeologists who wish to learn more of the information which can be derived from wooden artefacts – invaluable information, the worth of which has only recently been realised. Once again, BAR are to be congratulated on producing a reference work at a bearable price, but these congratulations should be tempered with exasperation at the very poor quality of the photographs, which, in the case of the magnified wood cross-sections, are too 'foggy' to be of any use to those wanting comparative material.

JANE WEEKS

BOWDEN, M. *Ape-men – fact or fallacy?* Bromley, Kent, Sovereign Publications, 1977. viii + 196 pp., 55 figs. £3.55 paperback.

Accepting hominid status only for *Homo sapiens,* Bowden argues that they existed from the Lower Plio-Pleistocene, while a consistent academic conspiracy accords hominid status on evolutionary grounds to material really pongid.

The book is divided into seven sections of unequal length. The first is an impassioned defence of Dawson and accusation of de Chardin as the perpetrator of the Piltdown fraud. However, the hoaxer's identity now seems less interesting than its rapid and uncritical acceptance by the then scientific world since it fitted their preconceived ideas.

Section II deals with the problems inherent in presenting publicly the fragmentary early hominid evidence. Any reconstruction depends on the preconceptions of the artist, but the extreme flimsiness of the basic evidence is often misleadingly obscured. We commit a mutual disservice in underestimating the layman's ability and interest. Bowden is also justifiably critical of the limits of confidence in radiometric dating and the archaeologist's willingness to accept as reliable only theoretically suitable dates.

A difficult problem exists in assessing hominids discovered and reported in the 19th century. Section III, although neither comprehensive nor accurate in detail, reconsiders such material, now mostly lost, attributed to *Homo sapiens* and allegedly found in early Plio-Pleistocene deposits in England, France, Italy and America. Only the pelvis, associated with a Late Pleistocene Rancholabrean fauna, found at Natchez, Mississippi, merits validation.

Sections IV, on China, and V, on Java, are the longest and most useful. This Far Eastern material, the holotypes for *Homo erectus,* poses serious problems in dating and assessment. Analogous African material is markedly different. While excavation standards at Choukoutien were not ideal by modern standards the deposits still exist but all the fossil material is lost, leaving only casts, whose accuracy cannot now be checked, of the reconstructed skulls. Re-excavation may clarify the status of the 'fire' evidence, a 7 m ash heap with no structured hearths, and the hominids. Whereas in Java, although the fragmentary hominid material survives, none was found *in situ* under controlled excavation conditions in well-stratified deposits. It is, therefore, undatable.

While rejecting Neanderthals, incorrectly assuming a marked cultural discontinuity during the Middle to Upper Palaeolithic transition, by substituting for the 'pathological brute' image a degenerate, syphilitic and malnourished creature with impeded speech, Bowden discusses briefly in Section VI allegedly early *sapiens* cranial vault fragments from Vertésszöllös, possibly contemporaneous with Choukoutien, Swanscombe and Fontéchevade. To reject *Homo erectus* as ancestral on these grounds alone is premature.

Section VII is an inadequate and unsatisfactory survey of the African material. Inaccuracies abound. OH 9 from site LLK in Upper Bed II is not of early Villafranchian but late Lower Pleistocene age. Anthropological reliance on the taxonomic evidence of teeth and jaws is not unacceptable but enforced by circumstances of survival. While criticising the Leakeys, Bowden seems to accept both *sapiens* status for KNM-ER 1470 and the genuine antiquity of Reck's skeleton, while rejecting AL 288-1 ('Lucy') and all the South African material as pongid.

Written in a sensational, incoherent and confusing style, this is a frustrating book to read due to inaccurate dates and misleading geological information. Also the unscaled hand-sketched illustrations are often unhelpful, while the differential timescales in Fig. 14 make cross-column comparisons impossible. None the less, it may prove worthwhile in stimulating critical re-examination of the incomplete and uncertainly dated *Homo erectus* and Neanderthals material.

ESMÉE WEBB

MITCHELL, G. F. and WEST, R. G. The changing environmental conditions in Great Britain and Ireland during the Devensian (last) cold stage. London, *Phil Trans R Soc B,* **280,** 1977. 103–374 pp., illus., 1 fiche. £19.00.

The conditions obtaining during the last glaciation are of the greatest relevance to archeologists, partly because the relict features from this period are often found beneath archaeological sites of all periods but also because the minutiae of physical and biological changes which emerge from detailed Pleistocene studies can be applied to the smaller scale climatic changes of the Holocene which is, after all, no more than a warm interlude within the Quaternary sequence. We are reminded of this fact from time to time by newspaper headlines based on recent papers in *Nature* intimating the imminent return of the ice-sheets but, although the climatic papers in this volume indicate how far away we still are from understanding the physical processes which lead to climatic change, we can gain some idea from deep sea cores of the time scale over which deglacial warming or onset of glaciation in middle latitudes lasted. The paper by Ruddiman, Sancetta and McIntyre suggests an average rate of 1°C per 1,000 years in both directions although the rate was faster at certain periods. For example, the greatest warming after the Devensian took place in the 2,800 year span between 13,700 and 11,900 BP at a rate of 2.6°C per 1,000 years. The date for the beginning of this warming agrees reasonably well with the terrestrial evidence derived from insects, but Coope finds that this interstadial (Windermere) declines at about 12,200 BP into a cool period which corresponds in time to the Allerød oscillation on the Continent. While the Middle and Late Devensian reflect similar though not synchronous fluctuations both within the British Isles and in Western Europe, the Early Devensian is still shrouded in mystery with little evidence on land for the apparently full glacial conditions represented in deep sea cores. Thus, even the boundary between Ipswichian and Devensian is doubtful both chronologically and stratigraphically.

Palynologists and entomologists are now turning to the problem of reconciling the discrepancies which have emerged in our picture of local habitats and floral and faunal communities during the interstadials. West points to the problems in interpreting palaeoclimates from subfossil assemblages because of our inadequate knowledge of the limits of tolerance of many plant species and his diagram (Fig. 1) of sites which have produced Early and Middle Devensian floras in the British Isles shows how limited they are in number and extent. That there was a strong regional differentiation of vegetation, at least in the Late Devensian, is shown both by Pennington, based on sites in western Britain from Cornwall to Scotland, and by Watts for Ireland. The simple model of uniform response by trees to increasing temperatures cannot now be substantiated for the British Isles.

The environmental preferences of the Coleoptera seem better known and often encompass narrow limits so that Coope is able to place more reliance on modern analogues when interpreting subfossil beetle assemblages, except where rapidly changing climatic conditions led to unusual communities.

The biological record relates mostly to the interstadials within the Devensian and we have to look to the physical record to gain some idea of the parameters of climate during the stadial periods. Most evidence comes from analogues within the present permafrost zone. Mitchell and Watson discuss relict periglacial features in Ireland and Britain respectively and the temperatures required to account for them in the past.

Although some authors (West and Shotton) make comparisons between British and Continental evidence, it is clear that then, as now, the peculiar position of the British Isles relative to the mainland and atmospheric circulation patterns produced modifications to conditions obtaining on the continental landmass. These differences would have been intensified by changing sea levels (Synge) and by the position of the polar front as mapped by the CLIMAP project of Columbia University. The final paper in the volume by Starkel summarises the evidence from eastern and western Europe and confirms the complications that arise if premature teleconnections are made between chronostratigraphic units in different regions.

JOAN SHELDON

DIMBLEBY, Geoffrey W. *Ecology and archaeology* (Studies in Biology 77). London, Arnold, 1977. 54 pp., illus. £3.00 hardback, £1.50 paperback.

This booklet is intended as an introduction to environmental archaeology for students and teachers at schools and colleges. In the opening paragraphs Professor Dimbleby argues the case for considering man as an ecological force; the role that archaeology has to play in the study of man's interaction with the environment is then examined. All the types of evidence commonly used in environmental archaeology are briefly discussed and the application of ecological studies is demonstrated by a number of examples.

Throughout the booklet Professor Dimbleby is clear and concise, the examples are well chosen and are good illustrations of a variety of problems and approaches. The booklet's only weakness is the lack of attention paid to the study of vertebrate remains in archaeology; this is, however, excusable as an adequate treatment of that topic would fill another volume. Despite its brevity this is a good introduction to the subject and a valuable addition to the series.

N. D. BALAAM

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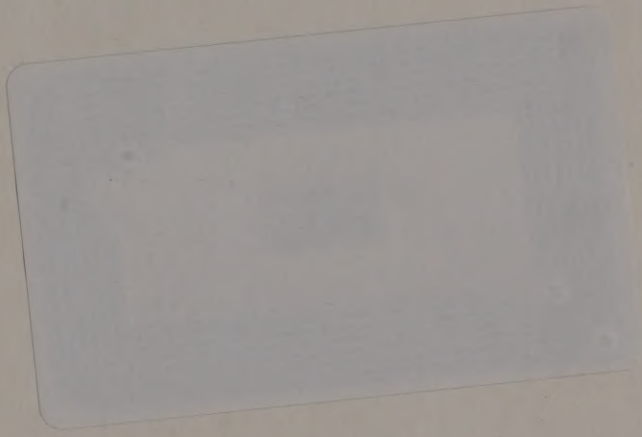

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